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Newark, New Jersey

PREPARED UNDER SUB-CONTRACT TO
DELEUW CATHER / PARSONS - SKIDMORE, OWINGS AND MERRILL

FOR THE
- U.S. DEPARTMENT OF TRANSPORTATION
  FEDERAL RAILROAD ADMINISTRATION
  NORTHEAST CORRIDOR PROJECT
  WASHINGTON, D.C. 20590

AND

- NEWARK REDEVELOPMENT
  AND HOUSING AUTHORITY

By
Wilbur Smith and Associates
December, 1980

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Gentlemen:

In accordance with our agreement, we are pleased to submit our Final Report, "Parking Feasibility Study, Newark Penn Station." The study addresses the economic feasibility of providing an exclusive rail use parking facility and a Central Business District parking structure in association with the proposed Gateway III Development.

Estimated 1988 rail parking space demands are expected to total 2,235 spaces. Assuming the majority of the existing rail parking supply remains within the study area, a 600-space rail parking facility is recommended to offset future parking deficits. Provision of a Central Business District-rail parking garage suggests a 1,200-space facility assuming full occupancy of the proposed Gateway III Development.

Projections of income versus cost have been prepared for each garage assuming two potential sites of development for the rail related facility and one for the CBD garage. Results indicated an economically feasible project for both the rail and CBD facility based on 30-year bonds and level debt service for 28 years at 10 percent. The analysis also includes the anticipated project grant for the CBD parking facility.

Our Project Managers, Frank LaMagna and F. Greg Lucado, join me in expressing appreciation to you and others in your organization for the cooperation received in connection with this project. We trust our work will be of value in the development of both improvements at Newark Penn Station.

Respectfully submitted,

WILBUR SMITH AND ASSOCIATES, INC.

E. M. Whitlock
Senior Executive Vice President

Registered Professional Eng.
New Jersey No. 15033

EMW/hc

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Chapter 1
INTRODUCTION

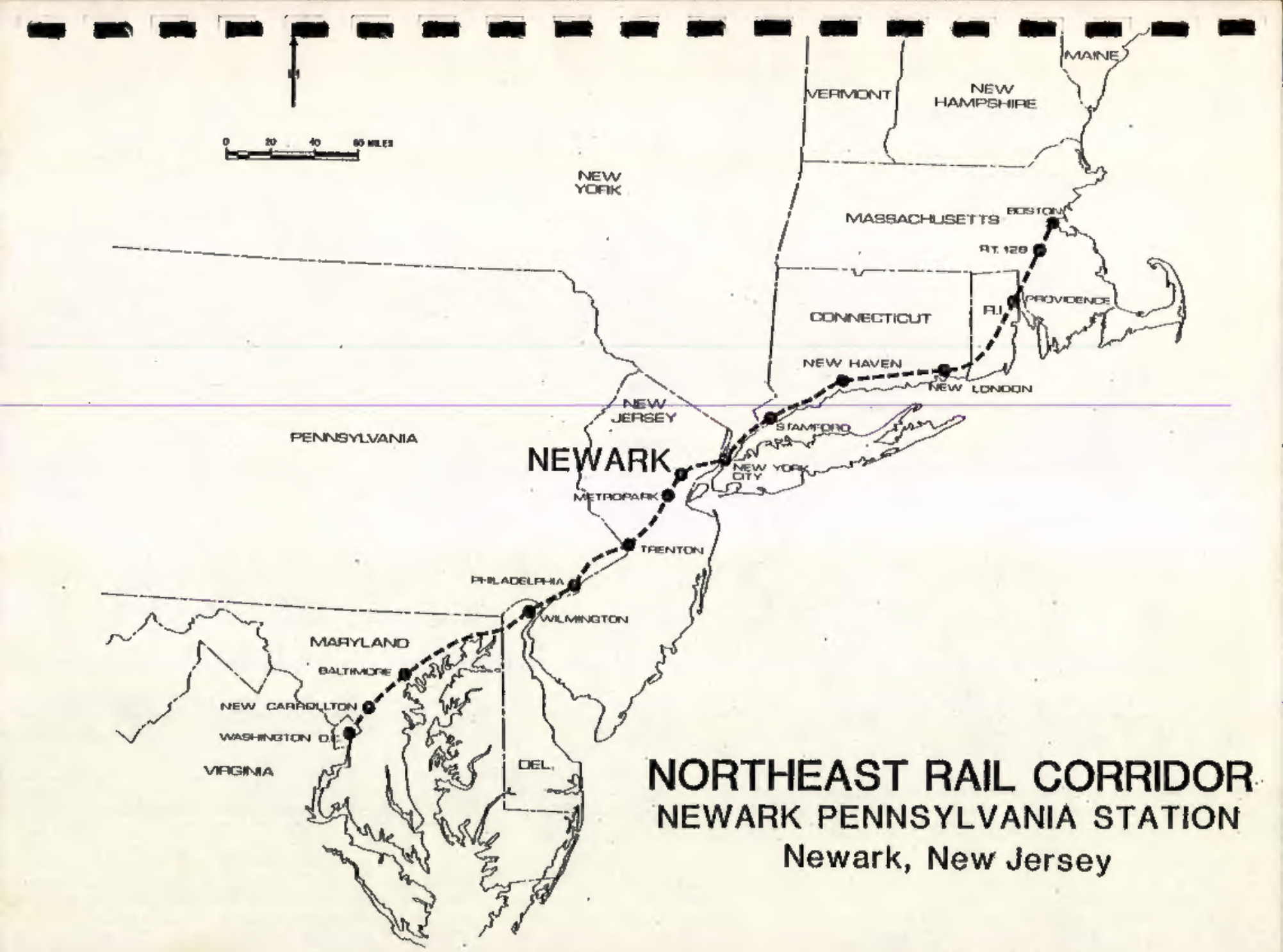
The Northeast Corridor Improvement Project represents a positive step taken by the Federal Government to make energy-efficient, high-quality rail transportation in the Corridor a reality. Newark Pennsylvania Station is a principal Northeast Corridor rail terminal serving arriving, departing, and transferring passengers of the Amtrak, Conrail, and Port Authority Trans Hudson (PATH) Railroads.

Newark Station is one of the 15 stations along the corridor from Boston to Washington that are being upgraded to accommodate the proposed high-speed rail service. Located midway between Boston and Washington, D.C., as shown in Figure 1, the Station serves as a hub for both commuter and non-commuter rail travel. The Station is also the origin of eastbound PATH trains bound for New York City and other New Jersey cities.

Purpose and Scope of Study

Plans for the redevelopment of Newark Penn Station include the consideration of constructing a parking garage on the west side of the Station. Several potential sites have been identified to fulfill this need.

The original scope of this study, funded by the Federal Railroad Administration (FRA), includes a study to determine the travel characteristics of boarding passengers at Penn Station, with emphasis on their parking habits and the economic feasibility of providing a rail-oriented parking facility. Also included is an inventory of all available parking spaces in the vicinity



Wilbur Smith and Associates

FIGURE

of the Station, characteristics of patrons of selected parking facilities within the study area, and usage and demand analyses of both on and off-street parking spaces. Field surveys of rail passengers for this study were funded by the Newark Redevelopment and Housing Authority.

As the study progressed, it became evident that if a parking facility is to be provided in this area, it should also contain adequate capacity to meet other study area parking requirements. For this purpose, additional funding was provided by the Newark Redevelopment and Housing Authority to undertake additional studies to determine the over-all area parking requirements and the economic feasibility of constructing a combined Rail/Central Business District parking garage.

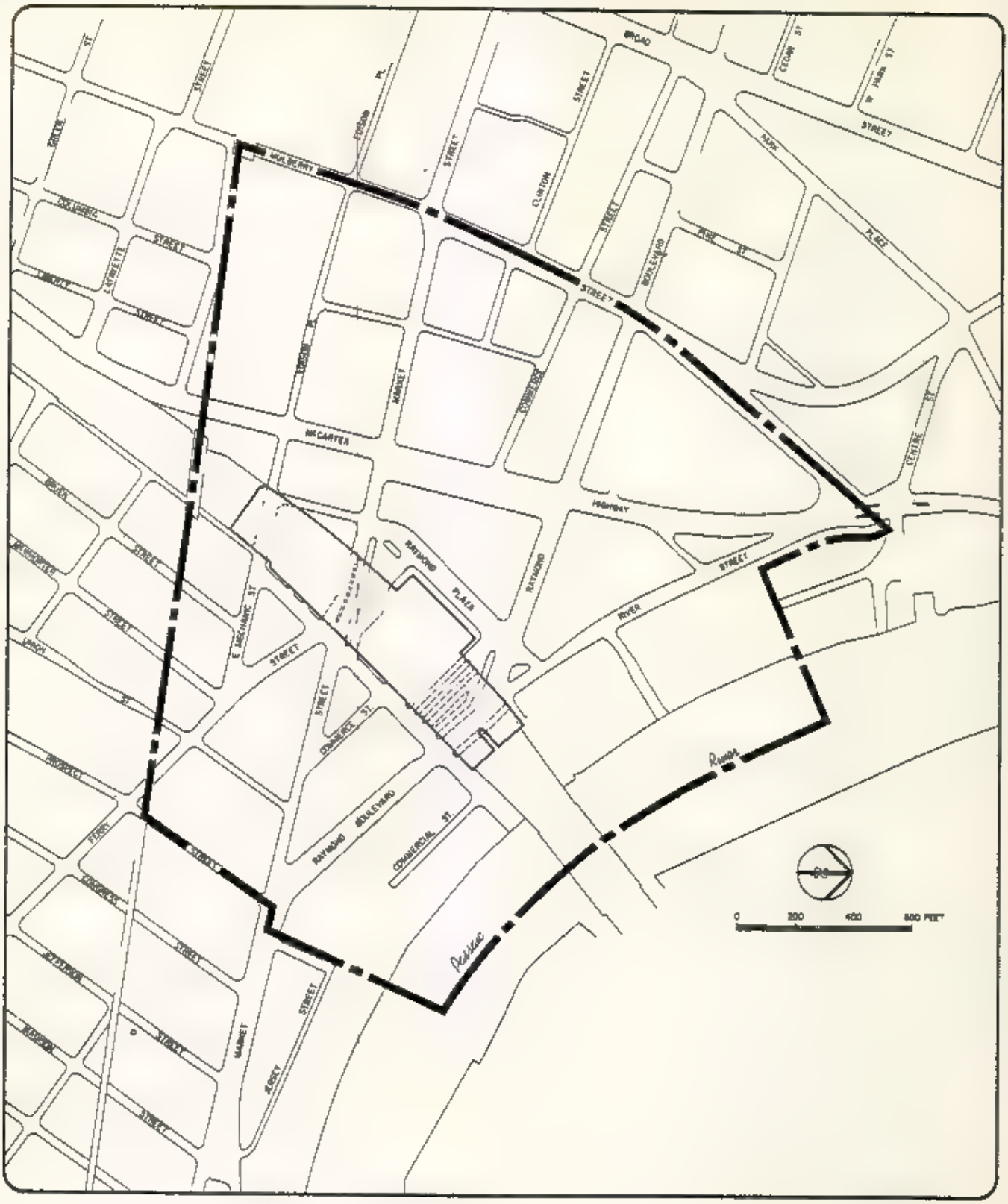
The study contains analysis of the planning data available to ascertain the number of parking spaces required, and pertinent cost-income projections for pro forma economic feasibility analysis.

The study addresses these questions:

- How many parking spaces should be provided to serve the area?
- What are the costs and revenues associated with this parking development?
- What is the economic feasibility of the parking relative to the expenditures of the City?

Study Area

A study area was delineated, shown in Figure 2, encompassing an approximate 23-block area surrounding Newark Penn Station. It is bounded on the west by Mulberry Street, on the north by Raymond



STUDY AREA
NEWARK PENNSYLVANIA STATION
NEWARK, NEW JERSEY

Wallace Smith and Associates

FIGURE 2

Boulevard-River Street, on the east by Prospect Street, and on the south by a freight line of the North-South Central Railroad of New Jersey Rail Line. Included in the study area are such major generators as the Hilton Hotel (Gateway Center I), the Western Electric Building (Gateway Center II), and other commercial facilities.

Field Studies

Field studies were conducted during the weeks of November 5, 1979, and April 14, 1980. Characteristics of rail passengers were obtained on Thursday and Friday, November 8 and 9, 1979, respectively, and supplemental surveys relative to other study area parkers were conducted in April, 1980.

Passenger Interviews - Questionnaires were administered to boarding passengers on the rail passenger platforms and in the waiting areas in order to obtain a profile of passengers based on the following characteristics:

- Trip origin/destination;
- Trip purpose;
- Parking duration;
- Location of parking;
- Changes made in travel habits during the recent fuel shortage; and,
- Attitudes toward criteria affecting garage site selection, including walking distance and cost.

Passenger surveys were conducted from 7:00 A.M. until 8:00 P.M. on both study days. A selected sample of boarding passengers was interviewed. The questionnaire is provided in Appendix A.

In addition to interviews conducted at the rail platforms, boarding subway passengers were also interviewed to determine their mode of arrival and parking habits. This additional survey determined the parking space demand generated by subway operations at Newark Penn Station.

Passenger Counts - All passengers boarding trains in the Station were counted during the hours of 7:00 A.M. to 8:00 P.M. by type of passenger: Amtrak, Conrail, or PATH.

Amtrak and Conrail passengers were counted and recorded by individual train departures. Due to the frequency of departure of PATH trains, PATH passenger boardings were recorded by 15-minute intervals.

Personnel conducting passenger counts for Amtrak and Conrail trains counted those remaining on the platform after the train's departure, and all passengers who left the platform.

PATH passengers were counted as they passed through the turnstiles providing access to the platform.

Parking Inventory - A field reconnaissance of existing parking spaces was conducted in a 23-block area in the Station environs. This observation resulted in the cataloging of all public and private parking spaces located within the study area, and the collection of the following information for each curb and off-street parking facility:

- Capacity;
- Existing parking charges;
- Hours of operation; and,
- Method of parking (self park and/or valet).

Other Areawide Parking Survey Counts - Accumulation and turnover counts were conducted at off-street parking facilities and curb parking locations throughout the study area. The purpose of these observations was to determine the size of the peak parking demand and the time of day the peak occurred. In addition, interviews were conducted at selected parking facilities to determine the origins, destinations, trip purpose, and durations of study area parkers.

Study Procedures

Interviews conducted on a Thursday and a Friday were analyzed to develop a profile of the rail passengers' typical weekday and Friday travel and parking patterns. Friday travel, from a rail station such as Newark's Penn Station, exhibits passenger characteristics distinctly different from weekday travel because it includes passengers with both weekday and weekend travel purposes.

Passenger counts conducted over a 13-hour period (7:00 A.M.-8:00 P.M.) were used as control totals for the expansion of interview data. During the two-day survey, over 950 interviews were obtained. Interview participants were categorized as peak (7:00-10:00 A.M.) or off-peak (10:00 A.M.-8:00 P.M.) to differentiate morning commuter arrival patterns. Interview data were expanded by a weighting technique to statistically reflect the characteristics of daily boarding passengers. Surveys of areawide parkers were expanded to reflect the total number of daily area parkers.

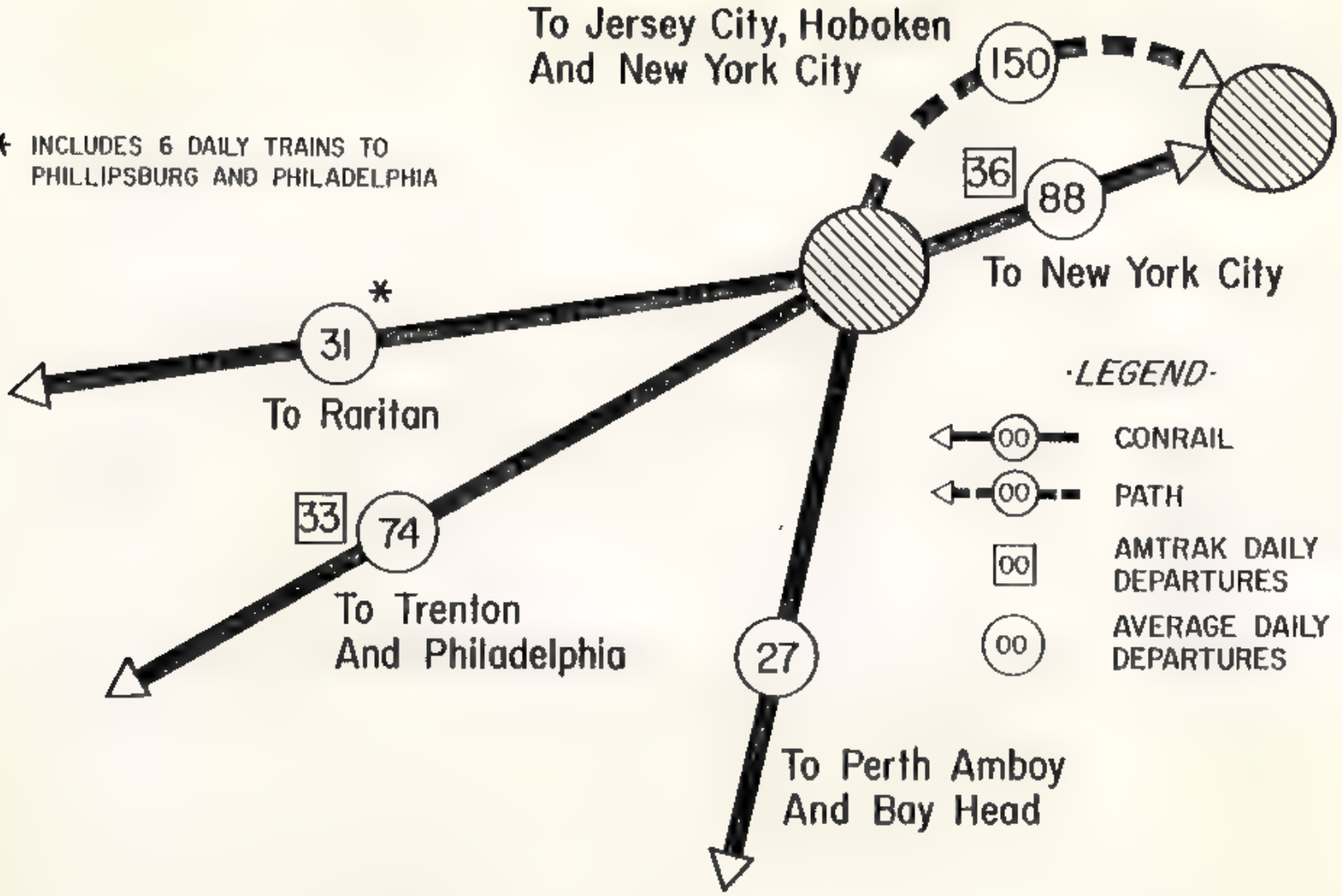
This information provided a basis for determining existing and future study area parking needs.

Chapter 2
EXISTING CONDITIONS

Newark's Pennsylvania Station is located near the intersection of New Jersey Route 21, the McCarter Highway, and Market Street on the eastern fringe of the City's Central Business District.

Both commuter and intercity rail transportation is provided at the Station. PATH provides commuter service between Newark and the World Trade Center, with connections to Hoboken Journal Square and Midtown Manhattan. Approximately 150 PATH trains depart this Station on a typical weekday. Additional commuter rail service is provided by the approximately 220 Conrail trains which depart Newark's Penn Station on a typical weekday. Conrail service, depicted in Figure 3, is provided along three basic rail lines. The Raritan Valley Line serves points to the west of Newark, including Cranford, Bound Brook, Raritan, and West Trenton. The North Jersey Coast Line serves points south along the coast, including Elizabeth, Perth Amboy, Long Branch, Asbury Park, and other coastal cities. A third line provides service between Newark and Trenton, New Jersey, and Philadelphia, Pennsylvania.

Intercity rail service is provided by Amtrak and encompasses both Metroliner and regular Amtrak services. Nearly 70 Amtrak intercity trains have scheduled stops at the Newark Station on a typical weekday. These trains constitute Amtrak's Northeast Corridor Service which connects Washington, D.C., with Boston.



EXISTING WEEKDAY RAIL SERVICE

DEPARTURES FROM NEWARK PENNSYLVANIA STATION

NEWARK, NEW JERSEY

Existing Parking Supply

A complete parking inventory was conducted in the study area. The inventory revealed the quantity, location, availability, special restrictions, and parking rates for all curb and off-street parking facilities. The parking inventory revealed 4,993 parking spaces in the study area, of which 196 spaces (4 percent of the total supply) are at curb locations.

Curb Parking Inventory - The amount and type of curb parking spaces are summarized in Table 1. Of the total 196 curb parking spaces, 106 spaces have one-hour meters, while the remaining 90 spaces are unmetered. At the metered locations, 44 spaces have peak-hour "NO PARKING" restrictions in effect. Non-metered parking spaces represent 46 percent of the total curb parking supply. Of the 90 non-metered spaces, 50 are unrestricted and 15 have peak-hour restrictions. There are 6 spaces reserved for the handicapped and 19 spaces have one-hour time limits.

Figure 4 illustrates the location of curb parking spaces throughout the study area. As noted, the majority of the unrestricted spaces are located south of McCarter Highway.

Off-Street Parking Space Inventory - The 23-block study area includes 24 off-street parking facilities, including three garages. As shown in Figure 5, the parking facilities range in capacity from 50 spaces to 533 spaces.

Commercial-public parking facilities provide a total of 4,187 parking spaces, of which 3,373 spaces are located in surface parking areas and 814 spaces are found within three parking garages. Private parking lots, for use by employees and customers, afford 340 parking spaces, or 7 percent of the total off-street parking supply. An additional 270 private parking spaces are provided

Table 1

PARKING SPACE INVENTORY

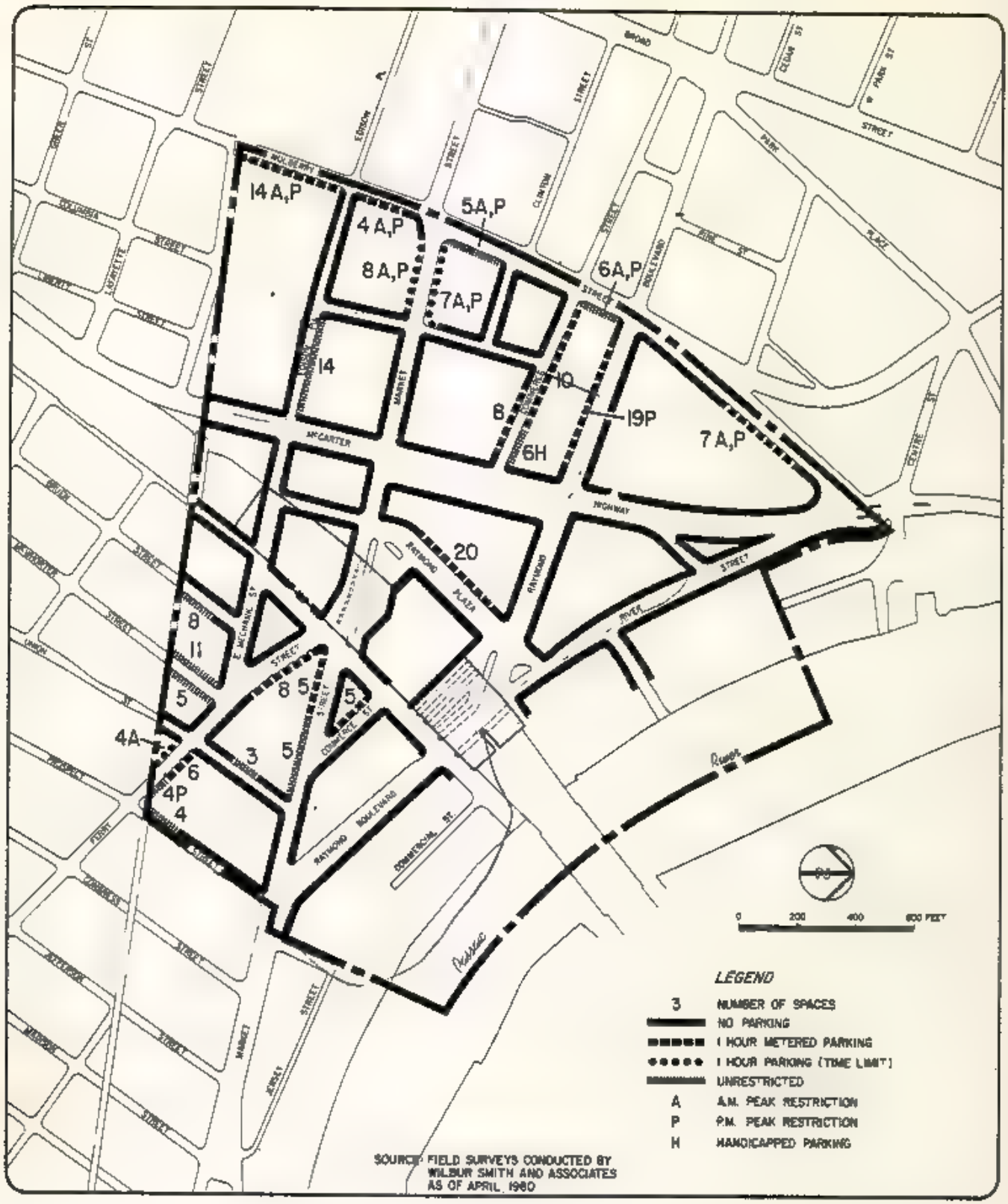
Newark Penn Station Parking Study

Newark, New Jersey

TYPE OF PARKING[1]	NUMBER OF SPACES	PERCENT OF TOTAL	PERCENT OF COMBINED TOTAL
Curb:			
One Hour Metered Spaces			
No Restrictions	62	32	1
Peak Hour Restrictions	44	22	1
Subtotal	106	54	2
Non-Metered Spaces			
Unrestricted	50	26	1
Peak Hour Restrictions	15	8	Neg.
Reserved Handicapped			
Spaces	6	3	Neg.
One Hour Time Limit[2]	19	9	Neg.
Subtotal	90	46	2
TOTAL CURB	196	100	4
Off-Street:			
Private Surface Lot	340	7	7
Private Garage(3)	270	6	5
Commercial Surface Lot	3,373	70	68
Commercial Garage[4]	814	17	16
TOTAL OFF-STREET	4,797	100	96
COMBINED TOTAL	4,993		100

(1) For location of parking facilities see Figures 3 and 4.
(2) Includes some peak restricted spaces.
(3) Includes 270 private spaces in garage located on the block bounded by Raymond Boulevard, McCarter Highway and Mulberry Street.
(4) Based on an estimate of 125 spaces for the garage located on McCarter Highway at Raymond Boulevard, including 263 public spaces in garage located on the block bounded by Raymond Boulevard, McCarter Highway and Mulberry Street.

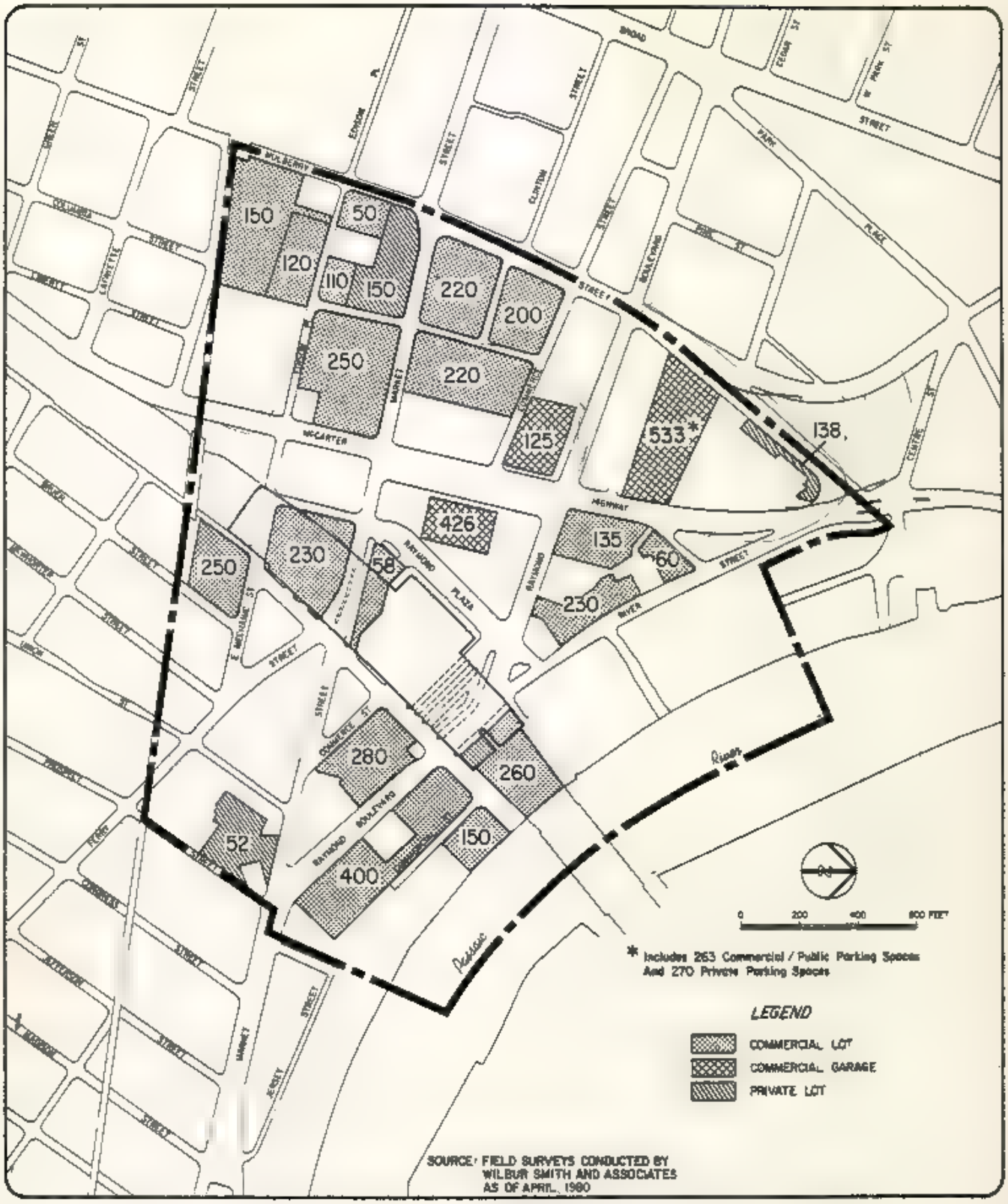
SOURCE: Wilbur Smith and Associates Field Survey as of March, 1980.



EXISTING CURB PARKING SUPPLY
NEWARK PENNSYLVANIA STATION
NEWARK, NEW JERSEY

Wilbur Smith and Associates

FIGURE 4



EXISTING OFF-STREET PARKING SUPPLY
NEWARK PENNSYLVANIA STATION
NEWARK, NEW JERSEY

Wilbur Smith and Associates

FIGURE 5

within the 533-space garage providing for 263 commercial parking spaces and 270 private (Public Service Electric and Gas Company [PSE&G] official vehicle spaces) parking spaces.

Parking Operations

All of the off-street parking facilities within the study area are privately operated, with the exception of the lot provided for the employees and students of Essex County College. Facility operations are predominantly self-parking with fees collected by a cashier.

Parking Charges - Parking rates at off-street facilities located within the study area vary relative to the facilities' distance from the Railroad Station. Daily parking rates vary from a low of $1.15 in the northwest corner of the study area, to $5.00 per day at one of the parking lots located under the Station's platform.

Transient parking rates are summarized in Table 2. As noted, for one hour of parking, the average charge is $1.00. This increases to $1.55 for two hours of parking and $1.85 for three hours of parking. The average all day charge in the study area is $2.15.

Monthly parking rates are available at about 50 percent of the off-street parking facilities. These rates vary from a low of $20.00 per month to a high of $75.00 per month.

Accumulation of Parkers - Accumulation counts were made at curb and off-street facilities within the study area. As shown in Table 3, the peak accumulation occurs at 1:00 P.M. when 4,160 of the 4,993 available parking spaces are occupied. This represents a peak demand of 83 percent of the total parking capacity

Table 2

DISTRIBUTION OF PUBLIC TRANSIT PARKING RATES

Newark Penn Station Parking Study

Newark, New Jersey

PARKING CHARGES (1)	PARKING DURATION AND NUMBER OF PARKERS			
	Up To 1 Hour	Up To 2 Hours	Up To 3 Hours	All Day (2)
$0.65	110	-	-	-
0.70	600	-	-	-
0.75	1,070	-	-	-
0.85	400	-	-	-
1.00	-	160	-	-
1.15	230	-	610	480
1.20	1,120	400	-	-
1.25	-	250	50	-
1.35	-	135	-	-
1.40	-	400	-	-
1.50	60	1,160	60	50
1.60	-	-	250	250
1.65	-	330	-	-
1.70	-	230	230	230
1.75	484	275	785	945
2.00	-	676	450	250
2.15	-	-	230	-
2.25	-	58	1,351	1,030
2.40	-	-	-	230
2.50	-	-	-	125
2.75	-	-	58	-
4.00	-	-	-	426
5.00	-	-	-	58
AVERAGE	$1.00	$1.55	$1.85	$2.15

(1) As of April, 1980.
(2) Twelve hours.
SOURCE: Wilbur Smith and Associates field surveys.

Table 3

ACCUMULATION OF PARKED VEHICLES

Typical Weekday

Newark Penn Station Parking Study

Newark, New Jersey

TIME	OFF-STREET Private Number of Vehicles	OFF-STREET Private Percent of Spaces	OFF-STREET Commercial Number of Vehicles	OFF-STREET Commercial Percent of Spaces	OFF-STREET Total Number of Vehicles	OFF-STREET Total Percent of Spaces	CURB (1) Number of Vehicles	CURB (1) Percent of Spaces	COMBINED CURB AND OFF-STREET Number of Vehicles	COMBINED CURB AND OFF-STREET Percent of Spaces
10:00 A.M.	485	80	3,300	79	3,785	79	275	140	4,060	81
11:00 A.M.	490	80	3,320	79	3,810	79	275	140	4,085	82
12:00 Noon	490	80	3,350	80	3,840	80	285	145	4,125	83
1:00 P.M.	495	81	3,385	81	3,880	81	290	148	4,160	83
2:00 P.M.	485	80	3,290	79	3,775	79	280	143	4,055	81
3:00 P.M.	470	77	3,215	77	3,685	77	345	176	3,490	70
4:00 P.M.	385	63	2,560	61	2,945	61	220	112	3,165	63
5:00 P.M.	225	37	1,490	36	1,715	36	200	102	1,915	38
6:00 P.M.	115	19	855	20	970	20	140	71	1,110	22
AVAILABLE SPACES	610		4,187		4,797		196		4,993	

(1) Values in excess of 100 percent reflect parkers in illegal curb spaces.
SOURCE: Field surveys conducted by Wilbur Smith and Associates, April, 1980.

within the study area. This usage rate is somewhat consistent throughout the day (10:00 A.M. - 3:00 P.M.).

The number of vehicles parked in off-street facilities peaks at 1:00 P.M. with 81 percent of all spaces occupied. At 5:00 P.M., 1,715 vehicles are parked, representing 36 percent of the available off-street spaces. At 6:00 P.M., about 970 vehicles are parked in off-street facilities in the study area, representing usage of only 20 percent of the available off-street parking spaces. Accumulation patterns are higher at commercial facilities, as compared with private off-street facilities.

A similar survey was conducted to monitor the accumulation of parked vehicles at curb parking spaces within the study area. The number of vehicles parked in curb spaces within the study area remained significantly high--in excess of 100 percent of the available supply--between 10:00 A.M. and 5:00 P.M. This value reflects curb parkers utilizing illegal spaces, with about 150 illegally parked vehicles during the peak hour. The usage rate of curb spaces within the study area also dropped after 5:00 P.M.

Parking Space Usage - A total of over 5,800 parkers are accommodated within the study area between the hours of 8:00 A.M. and 6:00 P.M. The majority of these parkers, 5,335, utilize the off-street parking areas. As shown in Table 4, the average turnover (number of parkers per space per day from 8:00 A.M. to 6:00 P.M.) within the study area is 1.2 parkers.

The average turnover at curb parking spaces totals about 2.5 parkers per space per day, with metered and non-metered spaces having a turnover of 2.9 and 2.0 parkers per space per day, respectively. Turnover at off-street parking facilities is much lower, averaging 1.1 parkers per space per day.

Table 4

PARKING SPACE USAGE

Typical Weekday 8:00 A.M. to 6:00 P.M.

Newark Penn Station Parking Study

Newark, New Jersey

TYPE OF PARKING	NUMBER OF PARKERS (1)	NUMBER OF SPACES	TURNOVER (2)
Curb:			
One Hour Metered	305	106	2.9
Non-Metered Spaces	180	90	2.0
Subtotal	485	196	2.5
Off-Street:			
Private Facilities	510	610	0.8
Commercial Facilities	4,825	4,187	1.2
Subtotal	5,335	4,797	1.1
TOTAL	5,820	4,993	1.2

(1) 8:00 A.M. to 6:00 P.M., includes illegal parkers.
(2) Number of parkers per space per day.
SOURCE: Wilbur Smith and Associates field surveys as of April, 1980.

Rail Passenger Volumes

Boarding passenger volumes were recorded for a 13-hour period between the hours of 7:00 A.M. and 8:00 P.M. These counts were conducted on each of the Station's seven boarding platforms, and were used to determine the total number of Amtrak, Conrail, and PATH passengers boarding trains departing from Newark Penn Station.

Weekday Passenger Volumes - Approximately 37,400 passengers board trains at Newark's Penn Station on a typical weekday. PATH passengers account for 18,000, or 48 percent of the boarding passengers. Approximately 17,400 passengers board Conrail trains departing the Station on a weekday, constituting about 46 percent of the passenger boardings. Amtrak passengers account for approximately 2,000 boardings, or 6 percent of the total. Typical weekday passenger volume counts are summarized in Table 5 by hour of the day. About two-thirds of the PATH passengers departing the Station on a typical weekday board trains during the peak period between 7:00 A.M. and 10:00 A.M. Conrail boarding volumes, although reflecting substantial increases in the evening peak hours, are largely attributed to PATH passengers transferring to Conrail trains during the evening hours. Amtrak boarding volumes show a slight evening peak with relatively constant activity throughout the morning and afternoon.

Friday Passenger Volumes - Nearly 45,000 passengers board trains at Newark's Penn Station on a Friday, as noted in Table 6. This represents an increase of 20 percent over typical weekday passenger boarding volumes. Conrail boardings on a typical Friday are 36 percent higher than weekday passenger volumes. Amtrak and PATH boardings show little change between weekday and Friday volumes.

Table 5

TYPICAL WEEKDAY BOARDING PASSENGER VOLUMES

Newark Pennsylvania Station

Newark, New Jersey

ONE HOUR PERIOD ENDING	NUMBER OF BOARDING PASSENGERS			
	PATH	CONRAIL	AMTRAK	TOTAL
8:00 A.M.	6,331	760	-	7,091
9:00 A.M.	4,994	809	79	5,882
10:00 A.M.	1,082	357	162	1,601
11:00 A.M.	497	282	39	818
12:00 Noon	515	125	85	725
1:00 P.M.	609	323	83	1,015
2:00 P.M.	485	239	59	783
3:00 P.M.	500	318	114	932
4:00 P.M.	665	739	92	1,496
5:00 P.M.	1,020	3,683	510	5,213
6:00 P.M.	759	7,741	550	9,050
7:00 P.M.	376	1,533	43	1,952
8:00 P.M.	179	524	128	831
TOTAL	18,012	17,433	1,944	37,389

SOURCE: Wilbur Smith and Associates Field Surveys, November 8, 1979.

Table 6

TYPICAL FRIDAY BOARDING PASSENGER VOLUMES

Newark Pennsylvania Station

Newark, New Jersey

ONE HOUR PERIOD ENDING	NUMBER OF BOARDING PASSENGERS			
	PATH	CONRAIL	AMTRAK	TOTAL
8:00 A.M.	5,179	1,012	56	6,247
9:00 A.M.	3,690	1,390	316	5,396
10:00 A.M.	1,072	407	151	1,630
11:00 A.M.	1,250	260	68	1,578
12:00 Noon	835	296	32	1,163
1:00 P.M.	946	510	78	1,534
2:00 P.M.	598	363	191	1,152
3:00 P.M.	734	718	145	1,597
4:00 P.M.	757	1,432	83	2,272
5:00 P.M.	1,845	5,848	460	8,153
6:00 P.M.	1,506	9,132	215	10,853
7:00 P.M.	524	1,949	125	2,598
8:00 P.M.	207	558	-	765
TOTAL	19,143	23,875	1,920	44,938

SOURCE: Wilbur Smith and Associates Field Surveys, November 9, 1979.

The hourly distribution of PATH passengers for Friday travel exhibits characteristics similar to those observed for typical weekday travel. The hourly distribution of Friday Amtrak boardings appears unaffected by commuter travel and exhibits no significant peaking characteristics.

Chapter 3
CHARACTERISTICS OF RAIL PASSENGERS

This chapter presents characteristics of rail passengers at Newark Penn Station. This information forms the basis for the determination of parking space requirements and revenue projections.

Characteristics of Rail Passengers

Personal interviews were conducted at Penn Station in order to determine travel characteristics of the rail passenger. The information sought included such items as trip origins/destinations, trip frequency, mode of arrival, and trip duration. In addition, certain attitudinal questions were also included relative to energy issues and walking distances.

Origins and Destinations of Rail Passengers

Passengers were interviewed to determine their origin prior to arriving at the Station, and their final rail destination. The majority of the responses indicated Newark and nearby cities as principal trip origins, although significant transfer passenger activity is indicated by the number of trips originating from New York City and New Brunswick. Newark is the origin of the rail trip for 60 percent of weekday boarding passengers compared with 67 percent of Friday boarding passengers having their trip origin in Newark, as shown in Table 7.

Weekday Travel - Passengers originating in Newark dominate weekday rail travel; however, a significant portion of Conrail and Amtrak travelers begin their weekday trips in New York City, reflecting the effect of transfer passengers. New Brunswick and other New Jersey trip origins make up a significant portion of weekday PATH passengers.

Table 7

PASSENGER PROFILE SUMMARY - TRIP ORIGIN

Newark Pennsylvania Station

Newark, New Jersey

TRIP ORIGIN	Peak PATH Number	Peak PATH Percent	Off Peak PATH Number	Off Peak PATH Percent	Peak Conrail Number	Peak Conrail Percent	Off Peak Conrail Number	Off Peak Conrail Percent	Peak AMTRAK Number	Peak AMTRAK Percent	Off Peak AMTRAK Number	Off Peak AMTRAK Percent	TOTAL Number	TOTAL Percent
WEEKDAY TRAVEL														
New York City	1,225	10	164	3	370	19	3,868	24	61	25	321	19	6,009	16
Other New York	152	1	--	--	25	1	260	2	--	--	16	1	453	1
Newark	6,980	56	3,900	70	1,293	67	8,974	58	169	70	1,050	62	22,366	60
Trenton	660	5	70	1	--	--	--	--	--	--	--	--	730	2
New Brunswick	1,476	12	702	12	39	2	1,455	10	--	--	220	13	3,892	10
Other New Jersey	1,480	12	769	14	170	9	668	4	11	5	56	3	3,154	8
Other	434	4	--	--	29	2	130	1	--	--	-	--	593	2
No Answer	--	--	--	--	--	--	152	1	--	--	40	2	192	1
TOTAL	12,407	100	5,605	100	1,926	100	15,507	100	241	100	1,703	100	37,389	100
FRIDAY TRAVEL														
New York City	725	7	207	2	--	--	2,194	10	--	--	97	7	3,223	7
Other New York	725	7	95	1	135	5	388	2	--	--	34	2	1,377	3
Newark	7,102	72	6,410	70	2,380	85	12,893	61	474	91	934	67	30,193	67
Trenton	--	--	613	7	--	--	559	3	--	--	68	5	1,240	3
New Brunswick	665	7	1,281	14	147	5	2,661	13	--	--	60	4	4,814	11
Other New Jersey	724	7	596	6	147	5	1,857	9	49	9	83	6	3,456	8
Other	--	--	--	--	--	--	--	--	--	--	89	7	89	--
No Answer	--	--	--	--	--	--	514	2	--	--	32	2	546	1
TOTAL	9,941	100	9,202	100	2,809	100	21,066	100	523	100	1,397	100	44,938	100

SOURCE: Wilbur Smith and Associates Field Survey, Week of November 5, 1979, values presented have been expanded based on sample surveys of rail passengers.

Friday Travel - Trip origins of passengers departing Newark on Friday exhibit characteristics similar to those of weekday passengers. In terms of total Friday departures, when compared with weekday departures, a major difference is an increase in the portion of origins at Newark, with a corresponding decrease in New York City trip origins. A general increase in total boarding volumes for Friday travel is primarily the result of increases in off-peak Conrail ridership. These increases can be attributed to a tendency toward intercity travel, as trip origins for New Brunswick, Trenton, other New Jersey cities, and locations in New York State outside the City of New York all show significant increases.

Trip Destination of Rail Passengers

The predominant rail destination of passengers departing Newark's Penn Station is New York City. Rail trip destination characteristics for weekday and Friday travel are shown in Table 8.

Weekday Travel - Peak travel on both the PATH and Conrail Lines is dominated by passengers destined for New York City. Off-peak travelers of the PATH and Conrail Systems, as well as the peak and off-peak passengers of Amtrak, also indicate New York City as the predominant rail destination. However, these travelers are less commuter-oriented and exhibit a broader distribution of destinations.

Friday Travel - Passenger destination characteristics for Friday boardings at Newark Penn Station are similar to those for weekday travelers; however, there are significant increases in destinations other than New York City. Similar passenger volume increases for destinations in New Jersey cities are exhibited by each of the three rail systems, especially during peak travel periods.

Table 8

PASSENGER PROFILE SUMMARY - RAIL TRIP DESTINATION

Newark Pennsylvania Station

Newark, New Jersey

TRIP DESTINATION	Peak PATH Number	Peak PATH Percent	Off Peak PATH Number	Off Peak PATH Percent	Peak Conrail Number	Peak Conrail Percent	Off Peak Conrail Number	Off Peak Conrail Percent	Peak AMTRAK Number	Peak AMTRAK Percent	Off Peak AMTRAK Number	Off Peak AMTRAK Percent	TOTAL Number	TOTAL Percent
WEEKDAY TRAVEL														
New York City	3,663	30	2,791	50	1,340	69	7,108	46	83	35	775	46	15,760	42
Philadelphia	616	5	70	1	46	2	--	--	15	6	56	3	803	2
Trenton	--	--	--	--	10	1	--	--	11	5	40	2	61	--
Washington, D.C.	6,666	53	284	5	50	3	153	1	22	9	63	4	7,238	20
Other New Jersey	608	5	2,210	40	139	7	1,896	12	15	6	150	9	5,018	14
Other New York	130	1	60	1	133	7	2,722	17	14	5	--	--	3,059	8
Other New England	594	5	--	--	173	9	3,524	23	81	34	619	36	4,992	13
No Answer	130	1	190	3	35	2	104	1	--	--	--	--	459	1
TOTAL	12,407	100	5,605	100	1,926	100	15,507	100	241	100	1,703	100	37,389	100
FRIDAY TRAVEL														
New York City	5,167	52	6,725	73	969	34	8,140	39	151	29	403	29	21,555	48
Philadelphia	2,114	21	95	1	215	8	1,117	5	49	9	150	11	3,740	8
Trenton	--	--	--	--	--	--	163	1	--	--	69	5	232	1
Washington, D.C.	665	7	--	--	--	--	--	--	127	24	249	18	1,041	2
Other New Jersey	1,995	20	2,382	26	1,423	51	10,878	51	196	38	291	21	17,165	38
Other New York	--	--	--	--	67	2	610	3	--	--	97	7	775	2
Other New England	--	--	--	--	--	--	157	1	--	--	73	5	230	1
No Answer	--	--	--	--	135	5	--	--	--	--	65	4	200	--
TOTAL	9,941	100	9,202	100	2,809	100	21,065	100	523	100	1,397	100	44,938	100

SOURCE: Wilbur Smith and Associates Field Survey, Week of November 5, 1979, values presented have been expanded based on sample surveys of rail passengers.

Trip Purpose of Rail Passengers

The primary trip purpose of all boarding passengers was ascertained during the passenger interviews conducted at the Station platforms. Boarding passengers were asked to classify their trip purpose as work/business, shopping, school, social/recreation, personal, or "other." Trip purpose characteristics of boarding passengers are presented in Table 9.

Weekday Travel - Travel for work and business is the predominant trip purpose of PATH and Conrail passengers boarding at the Newark Station. During the peak travel period, work/business travel dominates the PATH and Conrail Systems with 86 and 92 percent of the passengers, respectively. This value is somewhat lower during off-peak periods at about 65 percent. Work/business trips account for 59 percent of peak Amtrak travel and 50 percent of off-peak Amtrak travel. Social/recreation and personal travel account for the majority of the remaining Amtrak passengers.

Friday Travel - Each of the three rail lines serving Newark's Pennsylvania Station experiences increases in non-work/business travelers during peak periods on Friday, as compared with weekday travel. The trip purpose characteristics of Amtrak Friday travelers are similar to those of weekday Amtrak travelers.

Mode of Arrival of Rail Passengers

The mode of arrival of departing passengers is categorized as driver-parked (park-and-ride), passenger-parked (park-and-ride), passenger dropped off (kiss-and-ride), bus, taxi, walking, rail/subway, and other. The predominant mode of arrival for rail passengers departing Newark Station is rail and subway (transfer passengers), accounting for 53 percent of weekday passengers

Table 9

PASSENGER PROFILE SUMMARY - TRIP PURPOSE

Newark Pennsylvania Station

Newark, New Jersey

TRIP PURPOSE	Peak PATH Number	Peak PATH Percent	Off Peak PATH Number	Off Peak PATH Percent	Peak Conrail Number	Peak Conrail Percent	Off Peak Conrail Number	Off Peak Conrail Percent	Peak AMTRAK Number	Peak AMTRAK Percent	Off Peak AMTRAK Number	Off Peak AMTRAK Percent	TOTAL Number	TOTAL Percent
WEEKDAY TRAVEL														
Work/Business	10,597	86	3,794	67	1,767	92	9,985	65	142	59	860	50	27,145	72
Shopping	152	1	180	3	39	2	594	4	--	--	120	7	1,085	3
School	964	8	264	5	35	2	1,432	9	11	5	103	6	2,809	8
Social/Recreation	--	--	144	3	--	--	1,050	7	44	18	134	8	1,372	4
Personal	542	4	454	8	85	4	1,600	10	44	18	350	21	3,075	8
Other	152	1	769	14	--	--	846	5	--	--	136	8	1,903	5
TOTAL	12,407	100	5,605	100	1,926	100	15,507	100	241	100	1,703	100	37,389	100
FRIDAY TRAVEL														
Work/Business	7,886	79	6,884	75	1,975	70	14,189	67	298	57	664	48	31,896	71
Shopping	665	7	492	5	67	2	777	4	98	19	48	3	2,147	5
School	665	7	95	1	350	13	2,286	11	--	--	73	5	3,469	8
Social/Recreation	--	--	397	4	135	5	1,002	5	25	5	201	14	1,760	4
Personal	725	7	626	7	282	10	1,915	9	102	19	346	25	3,997	9
Other	--	--	708	8	--	--	896	4	--	--	65	5	1,669	3
TOTAL	9,941	100	9,202	100	2,809	100	21,065	100	523	100	1,397	100	44,938	100

SOURCE: Wilbur Smith and Associates Field Survey, Week of November 5, 1979, values presented have been expanded based on sample surveys of rail passengers.

and 49 percent of Friday passenger boardings. Bus arrivals account for 22 percent of weekday passengers and 21 percent of Friday passengers. Other values are presented in Table 10.

Weekday Travel - Arrival at the Station by subway, rail, or bus accounts for 53 percent of all rail passengers. This percentage is somewhat lower for Amtrak riders, especially for those boarding Amtrak trains. A total of 32 percent of peak Amtrak passengers arrive at the Station by automobile and are dropped off (kiss-and-ride). Approximately 150 passengers (4 percent of the total) are drivers of vehicles which are parked in the area.

Friday Travel - Mode of arrival characteristics of Friday rail passengers are similar to those of weekday travelers. Subway, rail, and bus are still the predominant means of arrival for Friday travelers. A total of about 1,500 drivers of parked vehicles board trains at Newark Penn Station on a typical Friday.

Subway Passengers - Mode of arrival characteristics were derived from special interviews conducted on the City Subway Platform at Newark's Pennsylvania Station for passengers departing Newark's Penn Station. Departing subway passengers were asked to categorize their mode of arrival at the Station as auto-parked, train, bus, or other. A total of over 900 boarding subway passengers was surveyed with only 2 percent of the respondents indicating arrival in an automobile which was parked in the vicinity of the Station. The majority of those passengers boarding the subway at Newark's Penn Station arrived at the Station by rail. These rail arrivals account for about 90 percent of all departing subway passengers. Bus arrivals resulted in 4 percent of total passengers while 4 percent of the respondents indicated other means of arrival at the Station.

Table 10

PASSENGER PROFILE SUMMARY - MODE OF ARRIVAL

Newark Pennsylvania Station

Newark, New Jersey

MODE OF ARRIVAL	Peak PATH Number	Peak PATH Percent	Off Peak PATH Number	Off Peak PATH Percent	Peak Conrail Number	Peak Conrail Percent	Off Peak Conrail Number	Off Peak Conrail Percent	Peak AMTRAK Number	Peak AMTRAK Percent	Off Peak AMTRAK Number	Off Peak AMTRAK Percent	TOTAL Number	TOTAL Percent
WEEKDAY TRAVEL														
Driver-Parked	484	4	279	5	132	7	484	3	13	6	99	6	1,491	4
Passenger-Parked	520	4	--	--	100	5	130	1	22	9	--	--	772	2
Passenger-Dropped	520	4	120	2	150	8	1,040	7	77	32	160	9	2,067	6
Bus	2,080	17	2,100	38	550	29	3,120	20	55	23	320	19	8,225	22
Taxi	390	3	--	--	--	--	390	3	--	--	120	7	900	2
Walked	130	1	420	7	50	3	390	3	22	9	160	9	1,172	3
Subway/Rail	7,753	63	2,245	41	731	37	8,513	54	26	11	655	39	19,953	53
Other	260	2	240	4	150	8	1,040	7	22	9	160	9	1,872	5
No Answer	270	2	201	3	63	3	400	2	4	1	29	2	967	3
TOTAL	12,407	100	5,605	100	1,926	100	15,507	100	241	100	1,703	100	37,389	100
FRIDAY TRAVEL														
Driver Parked	277	3	475	5	225	8	468	2	20	4	53	4	1,518	3
Passenger-Parked	--	--	95	1	--	--	300	1	49	9	16	1	460	1
Passenger-Dropped	1,995	20	190	2	135	5	1,200	6	245	48	240	17	4,005	9
Bus	1,995	20	2,565	28	675	24	3,900	19	49	9	272	19	9,456	21
Taxi	--	--	--	--	135	5	600	3	--	--	112	8	847	2
Walked	665	7	665	7	--	--	1,500	7	--	--	144	10	2,974	7
Subway/Rail	3,624	36	4,452	49	1,324	47	12,178	58	107	20	453	33	22,138	49
Other	665	7	570	6	135	5	225	1	--	--	80	6	1,675	4
No Answer	720	7	190	2	180	6	694	3	53	10	27	2	1,865	4
TOTAL	9,941	100	9,202	100	2,809	100	21,066	100	523	100	1,397	100	44,938	100

SOURCE: Wilbur Smith and Associates Field Surveys, Week of November 5, 1979, values presented have been expanded based on sample surveys of rail passengers.

Trip Duration of Rail Parkers

Trip durations for both weekday and Friday rail passengers are categorized in Table 11. Durations were determined by obtaining the time and date of return of interviewed passengers. Average durations, also shown in Table 11, are for returning passengers only.

Weekday Travel - The average parking duration of weekday rail travelers is 16.5 hours for both PATH passengers and Amtrak rail parkers.

Off-peak PATH riders generally have shorter trip durations with 71 percent parking for less than 8 hours. Amtrak rail parkers have characteristically longer trip durations, with over 50 percent having durations of over 24 hours.

Average trip durations of returning passengers are:

PASSENGER TYPE	TRIP DURATION
Peak PATH	14.5 Hours
Off-Peak PATH	7.0 Hours
Peak Conrail	19.5 Hours
Off-Peak Conrail	14.5 Hours
Amtrak (Average)	30.0 Hours

Friday Travel - Friday trip duration characteristics of parkers are similar to those of weekday rail parkers. The average trip duration of all rail parkers is 17.0 hours.

Rail parker duration characteristics for Friday travelers indicate a broader range of trip durations, with a greater percentage of longer durations, reflecting the increase of non-work trip purposes for Friday rail parkers.

Table 11

PASSENGER PROFILE SUMMARY - TRIP DURATION OF PARKERS

Newark Pennsylvania Station

Newark, New Jersey

DURATION OF TRIP	Peak PATH Number	Peak PATH Percent	Off Peak PATH Number	Off Peak PATH Percent	Peak Conrail Number	Peak Conrail Percent	Off Peak Conrail Number	Off Peak Conrail Percent	Peak AMTRAK Number	Peak AMTRAK Percent	Off Peak AMTRAK Number	Off Peak AMTRAK Percent	TOTAL Number	TOTAL Percent
WEEKDAY TRAVEL														
4 - 8 Hours	3	1	197	71	--	--	106	22	--	--	14	14	320	18
8 - 12 Hours	112	23	36	13	6	5	42	9	--	--	28	29	224	8
12 - 16 Hours	289	60	8	3	76	56	210	43	4	30	--	--	587	37
16 - 24 Hours	55	11	14	5	22	17	84	17	5	40	--	--	180	10
1 - 2 Days	17	3	--	--	16	12	--	--	--	--	14	14	47	13
2 - 3 Days	--	--	24	8	6	5	42	9	4	30	29	29	105	9
No Answer	8	2	--	--	6	5	--	--	--	--	14	14	28	5
TOTAL	484	100	279	100	132	100	484	100	13	100	99	100	1,491	100
AVERAGE	14.5 Hours		7.0 Hours		19.5 Hours		14.5 Hours		30.0 Hours		30.5 Hours		16.5 Hours	
FRIDAY TRAVEL														
4 - 8 Hours	8	3	323	68	36	16	78	17	--	--	6	11	451	20
8 - 12 Hours	61	22	43	9	48	21	236	51	--	--	2	4	390	26
12 - 16 Hours	161	59	57	12	72	32	38	8	6	30	12	23	346	23
16 - 24 Hours	36	13	--	--	39	18	--	--	--	--	2	3	77	5
1 - 2 Days	3	1	17	4	12	6	23	5	5	25	4	8	69	4
2 - 3 Days	--	--	3	1	11	5	17	3	7	35	18	39	56	4
3 - 4 Days	--	--	--	--	3	1	--	--	--	--	2	4	5	-
7 or more Days	--	--	--	--	--	--	32	7	--	--	--	--	32	2
No Answer	8	3	32	6	4	1	44	9	2	10	7	13	97	6
TOTAL	277	100	475	100	225	100	468	100	20	100	53	100	1,518	100
AVERAGE	14.0 Hours		9.0 Hours		17.5 Hours		23.0 Hours		36 0 Hours		38.5 Hours		17.0 Hours	

SOURCE: Wilbur Smith and Associates Field Surveys, Week of November 5, 1979, values presented have been expanded based on sample surveys of rail passengers.

Average trip durations for Friday travelers are:

PASSENGER TYPE	TRIP DURATION
Peak PATH	14.0 Hours
Off-Peak PATH	9.0 Hours
Peak Conrail	17.5 Hours
Off-Peak Conrail	23.0 Hours
Amtrak (Average)	37.5 Hours

Trip Frequency of Rail Parkers

Trip frequency characteristics of rail parkers are summarized in Table 12.

The predominant trip frequency of passengers departing Newark's Penn Station is five times per week. This reflects the high instance of commuter travel from the Station. As shown in Table 12, Amtrak riders tend to travel less frequently.

Location of Rail Passenger Parkers

Rail passengers interviewed on Station platforms who indicated they had arrived at the Station in a car parked in the area were asked to identify the location of their parked car on a map included with the survey. In addition, parker interviews conducted at the various parking facilities located throughout the study area included a question concerning the parker's destination while his/her car was parked. Analyses of data obtained in these two types of interviews provide a distribution of the location of rail parkers as well as a characteristic profile of the types of parkers using the various parking facilities throughout the study area.

Table 12

PASSENGER PROFILE SUMMARY - TRIP FREQUENCY OF PARKERS

Newark Pennsylvania Station

Newark, New Jersey

TRIP FREQUENCY	Peak PATH Number	Peak PATH Percent	Off Peak PATH Number	Off Peak PATH Percent	Peak Conrail Number	Peak Conrail Percent	Off Peak Conrail Number	Off Peak Conrail Percent	Peak AMTRAK Number	Peak AMTRAK Percent	Off Peak AMTRAK Number	Off Peak AMTRAK Percent	TOTAL Number	TOTAL Percent
WEEKDAY TRAVEL														
Every Weekday	140	29	95	34	51	39	165	34	--	--	--	--	451	30
4 Trips per Week	69	14	22	8	16	12	--	--	1	8	--	--	108	7
3 Trips per Week	--	--	59	21	7	5	44	9	--	--	12	12	122	8
2 Trips per Week	71	15	20	7	23	17	58	12	--	--	29	29	201	13
1 Trip per Week	131	27	22	8	15	12	97	20	3	23	--	--	268	18
3 Trips per Month	--	--	--	--	--	--	34	7	--	--	9	9	43	3
2 Trips per Month	--	--	11	4	7	5	--	--	5	38	--	--	23	2
1 Trip per Month	--	--	17	6	6	5	57	12	1	8	17	17	98	7
Occasionally	73	15	33	12	7	5	29	6	3	23	32	33	177	12
TOTAL	484	100	279	100	132	100	484	100	13	100	99	100	1,491	100
FRIDAY TRAVEL														
Every Weekday	66	24	128	27	88	39	239	51	--	--	1	2	522	35
4 Trips per Week	45	16	57	12	27	12	38	8	--	--	--	--	167	11
3 Trips per Week	5	2	62	13	11	5	--	--	1	5	--	--	79	5
2 Trips per Week	8	3	19	4	38	17	--	--	4	20	--	--	69	4
1 Trip per Week	87	31	67	14	28	12	38	8	4	20	7	13	231	15
3 Trips per Month	5	2	38	8	--	--	37	8	1	5	1	2	82	5
1 Trip per Month	17	6	24	5	11	5	37	8	6	30	5	9	100	7
Occasionally	33	12	61	13	10	5	79	17	4	20	37	70	224	15
No Answer	11	4	19	4	12	5	--	--	--	--	2	4	44	3
TOTAL	277	100	475	100	225	100	468	100	20	100	53	100	1,518	100

SOURCE: Wilbur Smith and Associates Field Surveys, Week of November 5, 1979, values presented have been expanded based on sample surveys of rail passengers.

Nearly 80 percent of all rail parkers use the surface parking facilities located east of the Station and beneath the Station platforms largely due to proximity to the Station and the cost of parking. Approximately 14 percent of rail parkers park in facilities located west of the Station. These parkers are primarily using the Gateway parking facility and the surface parking facilities located on existing housing authority land surrounding Gateway I and II. Approximately 100, or less than 7 percent of the total rail parkers, park their cars at the various curb spaces available throughout the study area.

McCarter Highway appears to be a line of delineation for rail parkers. Data collected indicate that peak or commuter rail travelers rarely use parking facilities located west of McCarter Highway. Use of parking facilities located west of McCarter Highway by off-peak rail parkers is also minimal.

Chapter 4
CHARACTERISTICS OF AREAWIDE PARKERS

Interviews were conducted with study area parkers during April, 1980, to ascertain characteristics of non-rail parkers within the study area. Information relative to trip origin, trip purpose, and parking duration was collected from parkers at selected parking facilities within the study area. These data were expanded to reflect all curb and off-street parkers within the study area during the hours of 7:00 A.M.-8:00 P.M.

Trip Origin of Parkers

Origins of parkers are summarized and presented in Table 13. Origins usually provide insight as to the best location for gaining access to the parking facility, since the parking area's interception of vehicles along the main arteries of the CBD is important in reducing unnecessary traffic burdens on the major street system.

The surveys reveal that the City of Newark represents the largest origin of study area parkers, accounting for 24 percent of the total. The Oranges represent 11 percent of the study area parkers, and Irvington, Elizabeth, Jersey City, Bayonne, and Hoboken represent an additional 13 percent of the parkers. Other New Jersey communities throughout the State represent 46 percent of the total study area parkers, whereas New York City-New York State and other states account for 5 and 1 percent, respectively.

Table 13

TRIP ORIGIN OF PARKERS

Newark Penn Station Parking Study

Newark, New Jersey

ORIGIN	NUMBER OF PARKERS	PERCENT
Newark	1,370	24
East, South, West Orange	595	11
Irvington	280	5
Elizabeth	245	4
Jersey City, Bayonne, Hoboken	215	4
Other New Jersey Communities	2,580	46
New York City-New York State	295	5
Other States	40	1
TOTAL	5,620	100

SOURCE: Field surveys conducted by Wilbur Smith and Associates, April, 1980.

Trip Purpose of Parkers

Of the 5,620 off-street and curb parkers within the study area, work trips generate 51 percent of the total, or 2,840 parkers, as shown in Table 14. Business trips generate 31 percent, or 1,735 parkers, and shopping trips foster 13 percent, or 745 parkers. The remaining 5 percent are attributed to "other" trip purposes--persons on recreation and pleasure trips. The results indicate the vast majority of trips within the study area are for purposes of work and business, accounting for 80 percent of all parkers within the study area. The influence of the railroad station parking is also reflected in these values as commuters who park in the study area are also included.

Parking Durations

A distribution of parking durations at off-street and curb parking facilities is shown in Table 15 and is categorized by trip purpose. The average parking duration varies from 1 hour 25 minutes for shopping trips to 7 hours 55 minutes for work trips The over-all average parking duration is 5 hours 25 minutes.

Approximately 92 percent of the shoppers park less than two hours as compared with 80 percent of the workers having parking durations in excess of 6 hours. Durations of parkers with business trip purposes are more evenly distributed with 65 percent of the parkers having durations of 4 hours or less.

Table 14

TRIP PURPOSE OF PARKERS

Newark Penn Station Parking Study

Newark, New Jersey

TRIP PURPOSE	NUMBER OF PARKERS	PERCENT
Shop	745	13
Business	1,735	31
Work	2,840	51
Other	300	5
TOTAL	5,620	100

SOURCE: Field surveys conducted by Wilbur Smith and Associates, April, 1980.

Table 15

PARKING DURATION BY TRIP PURPOSE

Newark Penn Station Parking Study

Newark, New Jersey

DURATION OF PARKING	TRIP PURPOSE								TOTAL	
	Shop		Business		Work		Other			
	Number of Parkers	Percent	Number of Parkers	Percent	Number of Parkers	Percent	Number of Parkers	Percent	Number of Parkers	Percent
0- 1 hour	420	57	505	29	-	-	70	24	995	18
1- 2 hours	210	28	330	19	-	-	40	13	580	10
2- 4 hours	55	7	295	17	195	7	70	24	615	11
4- 6 hours	30	4	195	11	380	13	65	21	670	12
6- 8 hours	15	2	310	18	785	28	45	15	1,155	20
8-10 hours	15	2	70	4	1,345	47	10	3	1,440	26
Over 10 hrs.	-	-	30	2	135	15	-	-	165	3
TOTAL	745	100	1,735	100	2,840	100	300	100	5,620	100
AVERAGE PARKING DURATION	1 hr-25 min.		3 hrs-30 min.		7 hrs-55 min.		3 hrs-30 min.		5 hrs-25 min.	

SOURCE: Field surveys conducted by Wilbur Smith and Associates, April, 1980.

Chapter 5
FUTURE PARKING SPACE REQUIREMENTS

Parking requirements of rail passengers, as well as persons oriented to other areawide parking generators within the study area were determined for 1988, the anticipated fifth year of operation of the proposed parking garage. Assuming an 18-month construction period, the initial year of garage operation is expected by 1983, with the fifth year of operation in 1988.

Rail Passenger Daily Unit Parking Demands

The number of parking spaces required per boarding passenger was determined and is referred to as the unit parking demand. This value can be applied to future ridership to evaluate the probable range of future parking needs for Newark Penn Station.

Current unit parking demands were derived through a process which related the duration of parking for typical weekday and Friday passengers to an entire week. Thus, the demand of the overnight parker, which is one space for two or more days, is reflected in the unit parking demand.

It should be noted that the unit parking demand reflects only the needs of park-and-ride rail passengers. The requirements of kiss-and-ride passengers are not included in the parking demand analysis.

The current unit parking demands as shown in Figure 6 are:

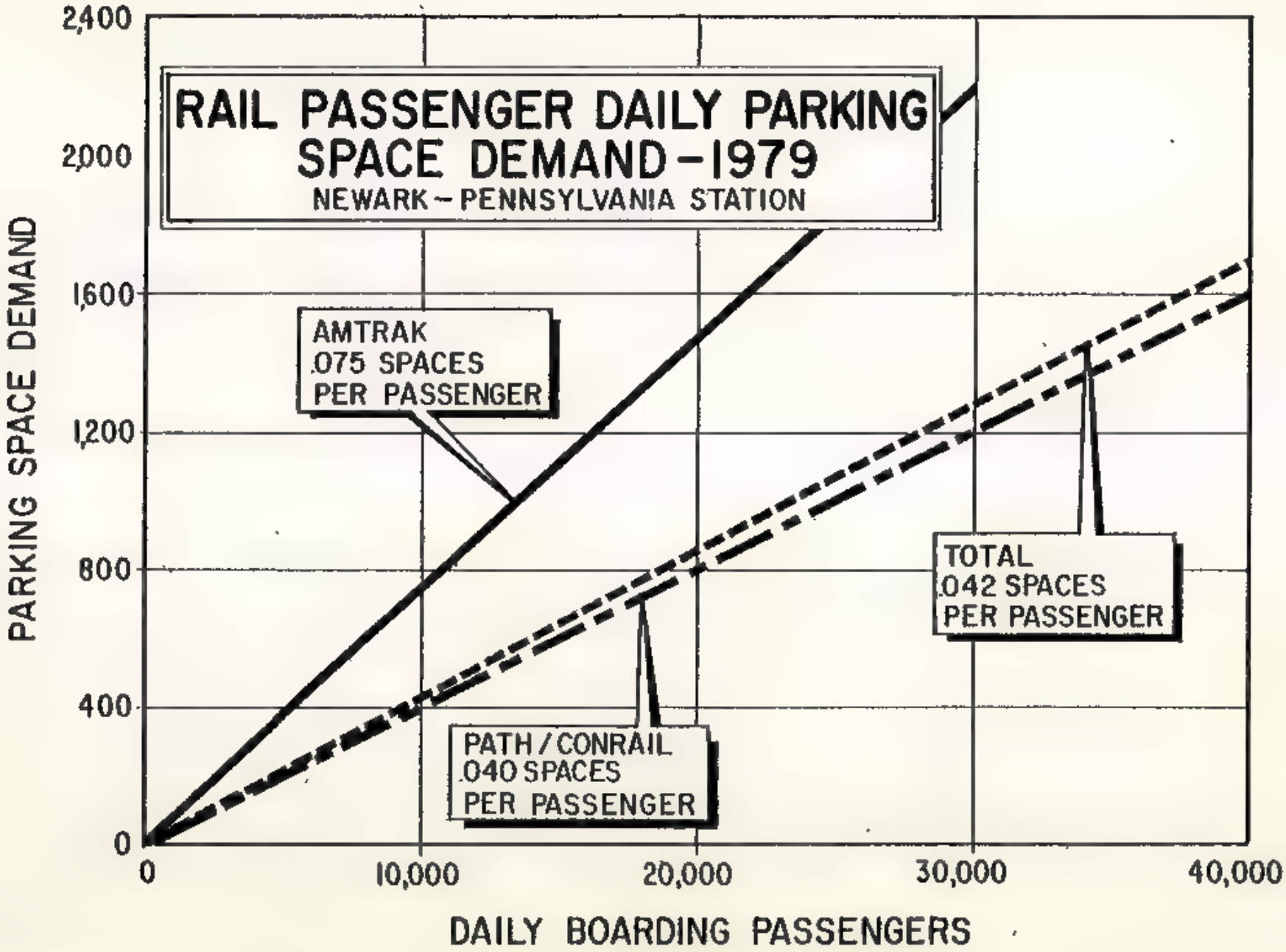
TYPE PARKING	NUMBER OF PARKING SPACES REQUIRED PER BOARDING PASSENGER
PATH	0.040
Conrail	0.040
Amtrak	0.075
Average	0.042

PATH Unit Parking Demand - The unit demand of all PATH passengers (0.040 spaces per passenger) is equivalent to the percentage of PATH passengers driving to the Station on a typical weekday (4 percent), caused by the fact that very few PATH passengers driving to the Station park overnight. Therefore, essentially one parking space is required by each park-and-ride-driver.

Conrail Unit Parking Demand - The unit parking demand for Conrail passengers is 0.040 as compared to 3.5 percent of the passengers arriving at the station as auto drivers. This slightly higher ratio reflects the effect of overnight parkers.

Amtrak Unit Parking Demands - The unit parking demand of Amtrak passengers is 0.075 spaces per boarding passenger. Due to the longer parking durations of Amtrak passengers, the number of parking spaces required is about 25 percent higher than the number of daily parkers.

While only about 6 percent of Amtrak passengers drive to the Station, the unit parking demand is 0.075 spaces per boarding passenger. The average parking durations of 30 hours on a typical weekday and 37.5 hours on a typical Friday increase the number of spaces required to accommodate Amtrak parkers.



Wilbur Smith and Associates

FIGURE 6

Total Unit Parking Demand - The current unit parking demand at Newark Penn Station is 0.042 spaces per boarding passenger. It should be noted that this number reflects the current proportions of Amtrak and Conrail passengers to total ridership. When determining the total unit parking demand of future ridership, the value should not be applied directly, but rather be derived from the combination of future Amtrak, Conrail, and PATH parking requirements. The proportions may not remain the same.

Future Rail Patronage

Patronage projections were developed by Wilbur Smith and Associates, based on historical trends and interpretations of anticipated future conditions. Various meetings and discussions were held with Conrail, New Jersey Transit, the Port Authority of New York and New Jersey, and other State and local officials to determine future rail patronage.

PATH Ridership - Future projections of PATH patronage are currently unavailable and historical data are limited; therefore, discussions were held with various officials to determine estimated 1988 patronage levels. As a conclusion of these discussions, minimum growth potential for additional PATH passengers arriving at Newark Penn Station by automobile appears likely. Future growth of PATH is likely to occur in the area of transfer passengers and this growth will have little effect on the total amount of parking spaces required for PATH riders. For purposes of this analysis, therefore, it will be assumed that current levels of parking demand for PATH riders can be expected to remain constant through 1988 conditions.

Conrail Ridership Projections - Estimates have been prepared by New Jersey Transit for the A.M. peak period between 7:00 and 10:00 A.M. at Newark Penn Station. These values reflect a 17 percent increase over a six-year period, or approximately 2.3 percent per year. Applying this factor to daily boardings results in an estimated 1988 daily passenger volume for Conrail passengers of 28,000 boarding passengers.

Amtrak Ridership - Patronage forecasts developed by the Federal Railroad Administration (FRA) show ridership for two environments: the first environment, labeled "Improved Conditions," includes track and service improvements called for in the Northeast Corridor project. The second environment (unimproved condition), is self-explanatory.

The following listing illustrates the Amtrak patronage projection developed by the Federal Railroad Administration and the projection developed by Wilbur Smith and Associates (WSA).

PROJECTIONS	1982	1990
	(annual passengers)	
FRA Improved Conditions	2,437,000	4,309,000
FRA Unimproved Conditions	944,000	1,158,000
WSA Improved Conditions	1,100,000	1,400,000

Lower ridership projections than FRA's by the Consultant recognize the positive impacts of energy considerations on rail travel and reflect more realistic assessments of certain key assumptions regarding future rail service. Federal Railroad Administration projections, as interpreted by the Consultant, include induced travel, based on reduced fares.

Recent fare increases indicate that this FRA assumption is inappropriate, at least in the near-term future. Similar concern on the part of the Consultant exists with respect to present day patronage as compared with 1976 values and level of service and demographic projections included in the higher FRA estimates (explained in the generally lower growth rate adopted by the Consultant for this analysis).

Total Patronage

Estimated total daily one-way ridership--a composite of PATH, Conrail, and Amtrak passengers--for the fifth year of operation of the proposed garage (estimated fifth year of operation 1988) represents the following:

PROJECTIONS	1988
PATH	20,000
Conrail	28,000
Amtrak (WSA-Improved Conditions)	4,200

It should be noted that the variable in the above values is the difference between the FRA projection for Amtrak ridership versus the WSA projection for Amtrak riders. Values for Conrail assumed an annual growth rate of about 2.3 percent, whereas ridership values for PATH are assumed to remain relatively constant, as previously discussed. As a result, for purposes of assessing future parking needs and economic feasibility, the estimated daily passenger volume of 52,200 passengers, including 20,000 PATH, 28,000 daily Conrail boardings, and 4,200 daily Amtrak boardings, has been utilized to project parking needs and revenues.

Future Rail Passenger Parking Requirements

Parking requirements for park-and-ride rail passengers were determined using the patronage projections discussed above. The unit parking demands developed from analysis of present conditions were applied to the patronage estimates to determine passenger parking requirements. Unit parking demand values, both 10 percent higher and lower than the current value, were applied to the patronage forecast to project the possible range of parking needs. A higher unit parking demand value reflects a change in modal split to an increased percentage of park-and-ride passengers. Unit parking demand values lower than the current value indicate the opposite, or an increase in passengers utilizing other modes to arrive at the Station.

The application of varying unit parking demands produces a range of future parking requirements. The changes in modal split incorporated into the unit demands would not greatly affect the number of future spaces required; i.e., the current unit parking demands as the indicator of the number of spaces required in the future.

PATH Daily Parking Requirements - For purposes of this analysis, it has been assumed that PATH ridership, originating from external trips to Newark Penn Station, will remain at a relatively constant level. As a result, the total 1988 parking needs for PATH passengers are 800 parking spaces. As the growth in PATH is expected to occur in the transfer passenger category, existing levels of activity have been utilized in order to determine parking space requirements.

Different unit parking demands were applied to the patronage projections to determine the effects of a 10 percent change in modal splits on parking requirements. The demands of 0.036 and 0.044 spaces per passenger were used in analysis of PATH parking requirements. These changes in the unit parking demand would require, in 1988, either an increase or decrease of only 80 parking spaces.

Conrail Daily Parking Requirements - The parking requirements were determined for Conrail passengers for 1988 based on an estimated daily one-way patronage figure of 28,000 passengers. The current unit parking demand of 0.040 for boarding passengers applied to the projection of patronage, reveals parking requirements of 1,120 spaces in 1988. To determine the sensitivity of this parking ratio, unit parking demands of 0.036 and 0.044 were also applied to the Conrail projections. Some of these values are used to confirm the range of magnitude acceptable for economic analysis. As a result, the use of the lower value results in a parking space requirement of about 1,010 spaces as compared to 1,230 spaces utilizing the higher value. Thus, the use of the ratio of 0.040 parking spaces per passenger falls within plus or minus 110 parking spaces of the suggested unit parking demand.

Amtrak Daily Parking Space Requirements - Amtrak daily parking space requirements are expected to total 315 spaces. This requirement is based on a unit parking demand of 0.075, as previously discussed.

The application of the higher and lower unit demands of 0.083 and 0.068 bases per passenger, respectively, yields a change of only 35 spaces in 1988.

Total Daily Rail Passenger Parking Requirements - As shown in Table 16, total parking space demands for 1988 are expected to total 2,235 parking spaces. Shown in Table 16 are the effects of utilization of the higher and lower unit parking demands. The variance of 225 parking spaces can be realized from the recommended parking spaces, utilizing the lower end or higher parking demand values for each category.

Existing and Future Parking Space Requirements

There are several methods by which the parking demands of a given major generator or study area can be determined. The most reliable consists of ascertaining the net on-site accumulation of auto drivers destined to the subject site. Based upon existing accumulation studies, the 1980 parking space demands total almost 4,200 parking spaces. Of this, 1,600 spaces can be associated with the demands generated as a result of park-and-ride passengers destined to Newark Penn Station. The remaining 2,600 parking spaces can be allocated from demands generated by the Gateway I and II developments, as well as other areawide parking needs.

Existing 1980 Parking Space Supply and Demand

There are approximately 4,993 curb and off-street parking spaces to serve the demands of the study area. Observation of parker habits and characteristics of parking space operations normally require an adjustment of parking supply. The total number of 4,993 parking spaces in the area does not represent the practical capacity for planning purposes. Adjustment to the overall number of parking spaces produces a figure representing

Table 16

ESTIMATED 1988 RAIL PASSENGER PARKING REQUIREMENTS

Newark Penn Station

Newark, New Jersey

TYPE OF RAIL PASSENGERS	PARKING SPACE REQUIREMENTS		
	Low Value	High Value	Suggested Parking Spaces
PATH	720	880	800
Conrail	1,010	1,230	1,120
AMTRAK	280	350	315
TOTAL	2,010	2,460	2,235

SOURCE: Wilbur Smith and Associates.

a practical capacity of the parking supply and reflects time consumed in parking, unparking, and other maneuverings.

Further, a reduction in off-street parking facilities greater than for curb facilities is normally required due to ticketing, cashiering, and other activities. Thus, inefficiencies of parking facilities result in a reduction of off-street parking capacity by approximately 15 percent at commercial, public parking facilities. At private off-street parking facilities, where parking is restricted to employees or private customer use only, the parking capacity is adjusted to reflect peak utilization of these facilities, as excess space is not considered available for general public parking.

With respect to curb parking spaces, a reduction factor of 10 percent is commonly used for planning purposes. The net adjusted parking supply results in 4,225 parking spaces through the study area.

Existing Parking Surpluses and Deficiencies - Based on an existing parking space demand of 4,150 parking spaces, parking space surplus within the study area of 75 parking spaces exists. This relatively minor surplus of overall parking space supply and demand indicates a balanced system with a minor surplus. Consideration of an individual block-by-block analysis should reveal some areas of overcrowding, whereas other areas might be under-utilized.

Estimated 1988 Parking Space Supply and Demand

Parking demands have been projected to 1988, which is the anticipated fifth year of garage operation for this project.

The impacts of energy costs are also taken into consideration for estimating future parking demands.

Gasoline Price and Consideration - An effort was made to determine the impact of energy constraints on mode of travel within the Newark area. One of the survey questions inquired about changes in travel patterns as a result of the recent gas shortage experienced in the Northeast. Table 17 summarizes the results of this question by trip purpose. Overall, 79 percent of the respondents stated that no change was made in their mode of arrival to the Railroad Station. Six percent of the passengers indicated they made fewer trips; 13 percent indicated they switched from auto to transit; and an additional 1 percent indicated they either switched to carpool or bought a smaller car.

A number of attitudinal studies have been undertaken in recent months to determine the desires of the motoring public. Certain observations are apparent: i.e., people support the energy conservation policy which has the least impact on them; and, the availability of gasoline is more influential in determining the choice of mode than the price.

Recent studies within the Tri-State Metropolitan Region support this conclusion. More than 70 percent of the respondents to the Tri-State survey indicated they have reduced their travel by auto as a result of the 1979 gasoline shortage. On the other hand, however, only 2 percent of those who had been using the automobile as their major means of getting to work have now switched to a different form of transportation.

Table 17

PASSENGER ATTITUDE SUMMARY

REACTION TO GASOLINE SHORTAGE BY TRIP PURPOSE

Newark Pennsylvania Station

Newark, New Jersey

REACTION TO GASOLINE SHORTAGE	TRIP PURPOSE													
	Work/Business		Shopping		School		Social/ Recreation		Personal		Other		Total	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Took Fewer Trips	3,246	5	115	3	856	14	224	7	175	3	120	3	4,736	6
Switched from Auto to Transit	7,027	12	375	12	800	13	532	17	1,491	21	301	9	10,526	13
Switched from Auto to Carpool	952	2	16	--	82	1	82	3	--	--	--	--	1,132	1
Bought Small Car	315	1	152	5	--	--	--	--	16	--	--	--	484	1
No Change	47,219	80	2,575	80	4,540	72	2,294	73	5,389	76	3,151	88	65,167	79
No Answer	282	--	--	--	--	--	--	--	--	--	--	--	282	--
TOTAL	59,041	100	3,233	100	6,278	100	3,132	100	7,071	100	3,572	100	82,327	100

SOURCE: Wilbur Smith and Associates Field Surveys, Week of November 5, 1979, values presented have been expanded based on sample surveys of rail passengers.

Similar surveys indicate a similar conclusion -- most respondents are reluctant to move closer to work and use available public transportation in lieu of the automobile; whereas the predominant response to an energy crisis is the purchase of a more fuel-efficient vehicle and use of the automobile less frequently.

The effects of restricted supply, or substantial cost of energy, will likely produce the following reactions from the motoring public:

- Ridesharing;
- Carpooling;
- Vanpooling;
- Purchase of a more fuel efficient vehicle;
- Shift from private automobile to transit;
- Walking;
- Making fewer trips; and,
- Trip chaining (multiple purpose trips).

Unless severe shortages or restrictions on the availability of fuel occur, the above changes will likely be gradual over a period of time. Additionally, according the the U.S. Government Department of Energy, by the late 1980's the demand for energy for motor vehicles will be less than the supply, as a result of more efficient engines and the availability of other energy sources. It is obvious,however, that there is a trend toward the reduction of the total number of vehicles in the CBD due to carpooling, transit, and other energy-saving devices. As a result, we would expect that future parking demands by 1988 would be reduced slightly, by approximately 10 percent.

Estimated 1988 Parking Space Needs

As previously discussed, Newark Penn Station is expected to require a total of 2,235 parking spaces for park-and-ride passengers. In addition, existing areawide needs are expected to be reduced from 2,400 parking spaces to approximately 2,000 parking spaces by 1988. This includes the loss of approximately 150 existing parkers on the triangular block bounded by Raymond Boulevard, McCarter Highway and River Street as part of the Housing Authority Riverfront Development Project. In addition to the existing areawide parking generators, planned new developments have also been considered. At the present time, of major consequence is the proposed Gateway III development, consisting of a 575,000 square foot commercial office building. The Gateway III project is planned to be located west of the Western Electric Building, (Gateway II) on the block bounded by Market Street, Mulberry Street, and Commerce Street. The project will eliminate approximately 640 surface parking spaces located in three parking lots on the site. A total of 575-850 parking spaces is estimated for this development, 1.0-1.5 parking spaces per 1,000 square feet, based on existing Housing Authority planning ratios depending upon the actual number of employees proposed. Although this value is somewhat lower than that conventionally used in suburban areas, the availability of mass transit and the impact of future energy costs necessitate conservatism in planning future parking. As a result, a total of 5,200 parking spaces should be required by the year 1988.

Estimated 1988 Parking Space Supply

In calculating the adjusted available parking supply for 1988, it was assumed there would be no appreciable change in available curb parking spaces. However, in those blocks where planned developments are anticipated, consideration is given to existing off-street parking spaces that will either be eliminated or added by land-use changes. The following is a list of

off-street parking changes anticipated by 1988:

- Elimination of 640 parking spaces as a result of removal of three surface parking lots to accommodate the proposed Gateway III development;

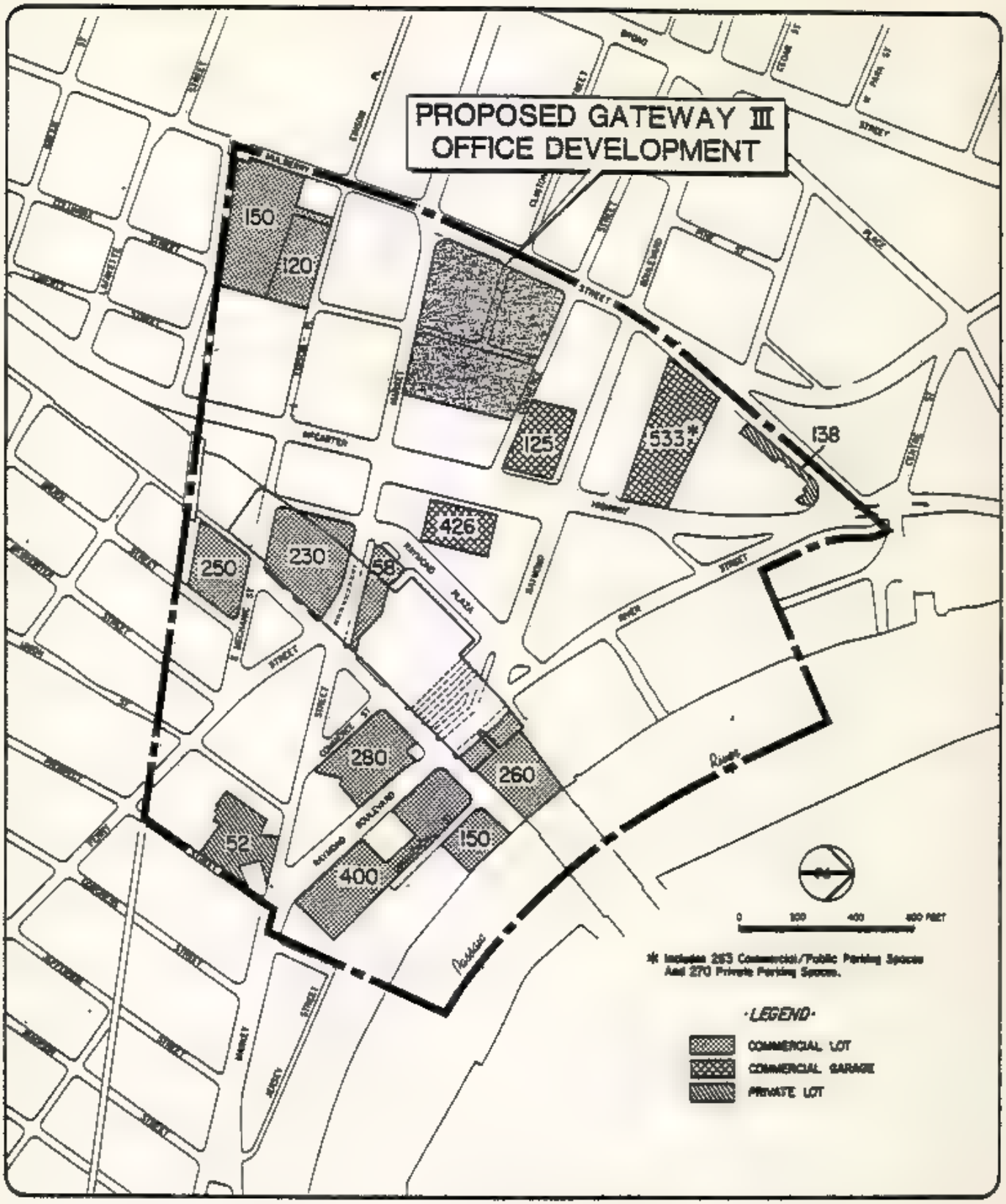
- Elimination of 410 commercial surface lot parking spaces and 150 private surface lot parking spaces on the block bounded by McCarter Highway, Edison Place, Mulberry Street and Market Street to facilitate the proposed rail parking structure or commercial development with self-contained parking; and,

- Elimination of 425 commercial surface parking spaces on the block bounded by Raymond Boulevard, McCarter Highway and River Street to facilitate the proposed rail parking garage or a riverfront commercial development with self-contained parking.

As a result, a total of 3,418 parking spaces can be expected by 1988, as shown in Figure 7. This results in an adjusted parking supply of 2,975 parking spaces (practical capacity for planning purposes).

Estimated 1988 Surpluses and Deficiencies

The estimated 1985 deficiency within the study area is presented in Table 18. As noted, a deficit of 1,835-2,135 parking spaces is expected should the proposed Gateway III development materialize and estimates of future rail passengers at Newark Penn Station occur.



ANTICIPATED 1987 OFF-STREET PARKING SUPPLY

NEWARK PENNSYLVANIA STATION

NEWARK, NEW JERSEY

Wilbur Smith and Associates

FIGURE 7

Table 18

ESTIMATED 1988 TOTAL STUDY AREA PARKING SPACE REQUIREMENTS

Newark Penn Station Study Area

Newark, New Jersey

ITEM	ESTIMATED NUMBER OF PARKING SPACES 1980	1988
Parking Space Supply		
Commercial Parking Spaces	4,187	2,762[1]
Private Parking Spaces	610	460[2]
Curb Parking Spaces	196	196
TOTAL	4,993	3,418
Adjusted Parking Supply	4,225	2,975
Parking Space Needs		
Newark Penn Station	1,600	2,235
Gateway III Development	--	575-875
Other Areawide Needs	2,550	2,000
TOTAL	4,150	4,810-5,110
Parking Space Surplus (or Deficit)	75	(1,835-2,135)

(1) Assumes the elimination of 1,475 commercial parking spaces.
(2) Assumes the elimination of 150 private parking spaces.

Consideration of Metropark Rail Parkers

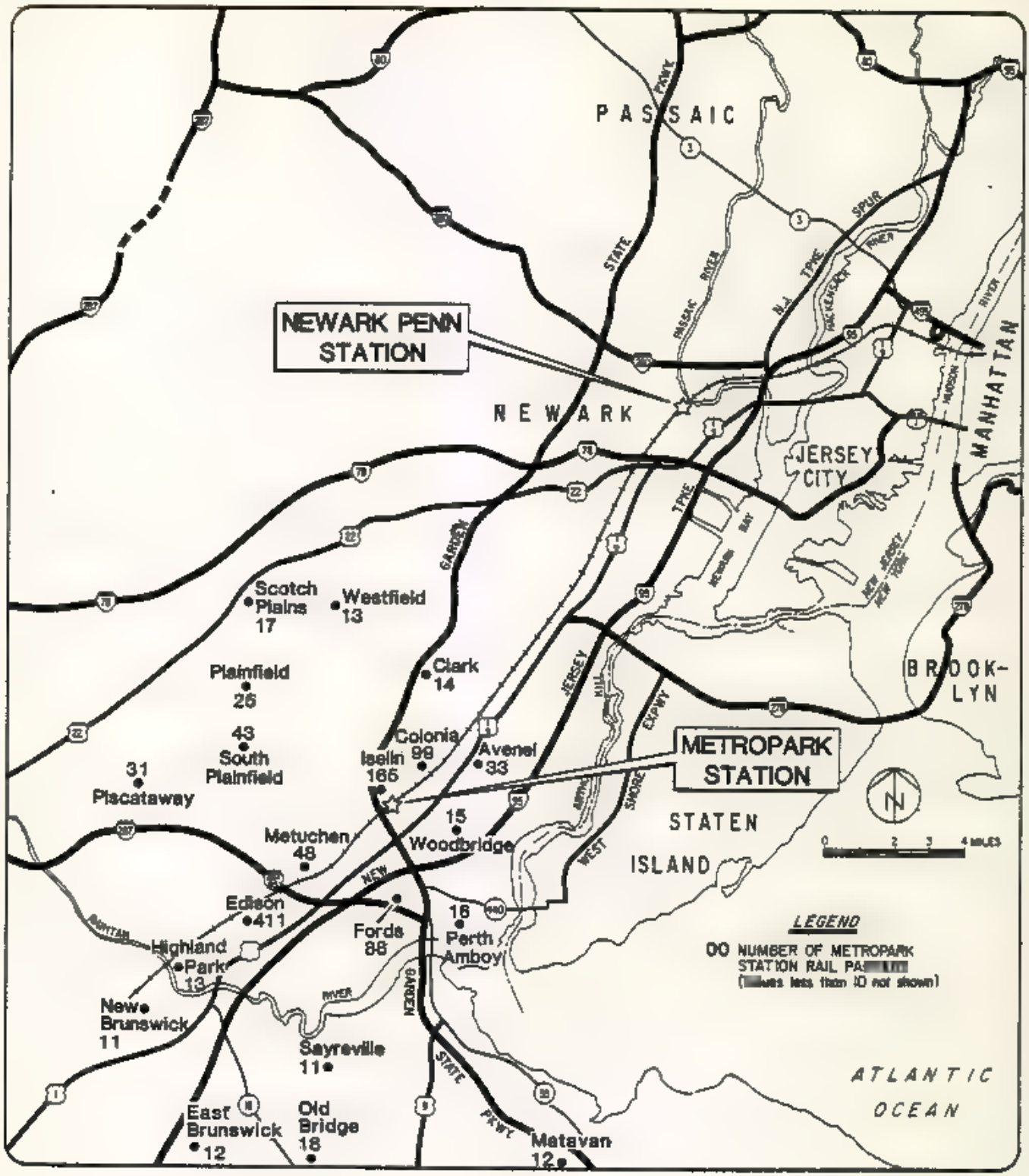
Concerns raised relative to the potential diversion of Newark Amtrak rail parkers to Metropark Station were also weighed. As a result an investigation of rail parker origins at Metropark Station was undertaken, as shown in Figure 8, utilizing data provided by the New Jersey Department of Transportation.

The majority of rail parkers oriented to Metropark Station are located to the west and south and are unlikely to utilize Newark Penn Station. There appears to be little if any diversion of Newark Penn Station Amtrak rail parkers.

Suggested Parking Garage Site Location

Potential sites for the proposed parking facility were identified by a representative of the Northeast Corridor Project and the Newark Redevelopment and Housing Authority. The sites selected were determined to be easily acquired and realistic in terms of planning for future parking. Three sites have been identified, as shown in Figure 9.

Site A is a triangular block bounded by Raymond Boulevard, McCarter Highway, and River Street and a parcel of land along the Riverfront. River Street will be closed. The site presently contains existing light manufacturing, industrial, and some commercial office buildings. As this land is not presently city-owned, negotiations would have to take place to acquire this property, demolish existing structures, and relocate tenants. This expense is expected to be borne by the Newark Housing and Redevelopment Authority to make this site attractive for a garage. The Housing Authority presently plans to acquire the block along with additional riverfront property which will also provide a more efficient footprint for a parking garage.



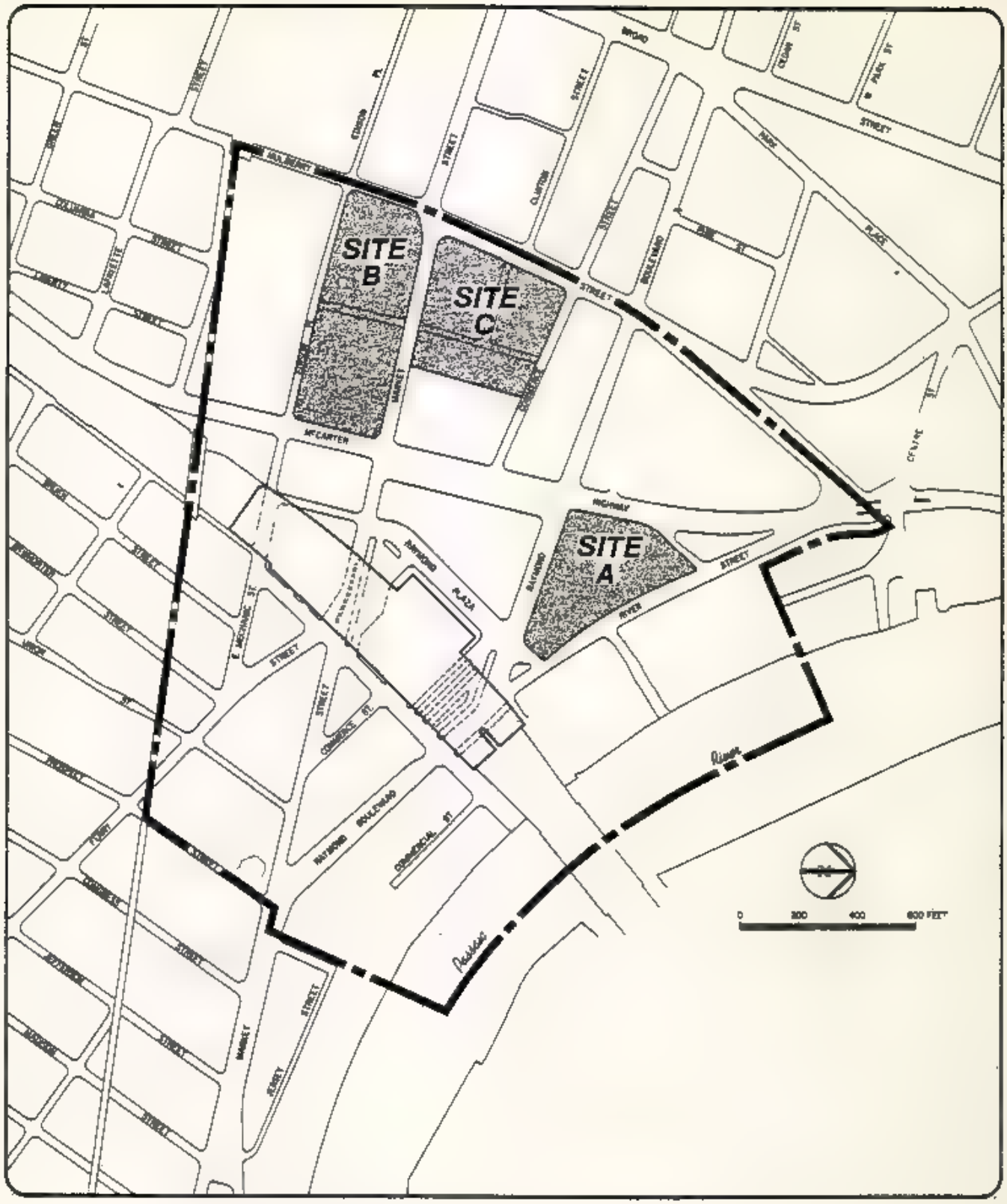
ORIGIN OF METROPARK RAIL PARKERS WITHIN 50 MILE RADIUS OF NEWARK PENNSYLVANIA STATION

NEWARK PENNSYLVANIA STATION

NEWARK, NEW JERSEY

Wilbur Smith and Associates

FIGURE 8



ALTERNATE SITE LOCATIONS
PROPOSED RAIL - CBD PARKING GARAGE
NEWARK PENNSYLVANIA STATION
NEWARK, NEW JERSEY

Vollmer Smith and Associates

FIGURE 9

Site B encompasses two parcels of Newark Redevelopment property bounded by McCarter Highway on the south, Edison Place on the west, Mulberry Street on the north, and Market Street on the east. The site is presently utilized for commercial surface parking leased to private operators on a short-term basis.

The third site originally considered is a viable location for a parking facility. The site is bounded by Market Street on the west, Mulberry Street on the north, Commerce Street on the east and the Western Electric Building on the south. Since the commencement of this study, Site C has become the prime location for the proposed Gateway III development, a 575,000 square-foot office facility. As a result, this site is not longer considered a potential location for rail parking but is a likely candidate for needs of Gateway III and other CBD needs.

Sites A and B have been further investigated to determine the economic feasibility of a proposed rail parking facility. Site C has been examined as a facility for both the Gateway III project and other CBD needs until such a time the second phase of Gateway III (an additional 400,000 square foot office building) can be completed.

Parker Attitudes Toward Walking Distances

In analyzing the two sites (Sites A and B), consideration was given to concerns of walking distance to Newark Penn Station. Rail parkers were interviewed to determine their attitudes toward walking distances in addition to their attitudes toward paying additional cost for an enclosed walkway.

Approximately 34 percent of the rail parkers indicated one block as a reasonable walking distance and 52 percent indicated two blocks as a reasonable walking distance, as shown in Table 19.

Table 19

PARKER ATTITUDES - REASONABLE WALKING DISTANCE

Newark Pennsylvania Station

Newark, New Jersey

	NUMBER OF PARKERS - PERCEIVED REASONABLE WALKING DISTANCE[1]											
	1 Block		2 Blocks		3 Blocks		4 Blocks		5 Blocks		TOTAL	
TRIP PURPOSE	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percen
Work/ Business	728	31	1,322	56	253	11	31	1	10	1	2,344	100
Shopping	67	100	--	--	--	--	--	--	--	--	67	100
School	16	47	23	--	--	--	--	--	10	30	34	100
Social/ Recreation	--	--	24	80	--	--	8	20	--	--	32	100
Personal	111	61	8	5	63	34	--	--	--	--	182	100
Other	16		61		--	--	--	--	--	--	77	100
TOTAL	938	34	1,423	52	316	12	39	1	20	1	2,736	100

(1) Reflects total parkers of two-day survey. Excludes 273 parkers not responding to the questions.

SOURCE: Wilbur Smith and Associates Field Surveys, Week of November 5, 1979

Of the parkers with work and business trip purposes, 56 percent indicated that two blocks is a reasonable walking distance.

A further investigation revealed the parkers' attitude toward walking in an enclosed walkway and paying any additional costs for this feature.

As noted in Table 20, 69 percent of all rail passengers indicated their willingness to walk an additional two blocks in an enclosed walkway to the rail station, and 48 percent indicated their willingness to pay additional costs. As a result, it appears that both Sites A and B can be attractively developed for rail parking, assuming an enclosed pedestrian link is provided from the parking facility to Newark Penn Station.

Suggested Parking Garage Size

Table 21 presents the recommended parking garage size for the rail parking facility as well as the CBD parking facility. The size of the proposed ramp is directly related to the assumption of passenger forecasts for Newark Penn Station and assumes full occupancy of the proposed Gateway III development. In addition, it has been assumed that a slight reduction will occur in future demands as a result of changes in modes due to high energy costs. Modifications of these assumptions will affect the parking garage size.

The process of determining the garage size included a downward adjustment of existing areawide public parking demand. The off-street public parking supply was also adjusted, as previously discussed, to allow for operational inefficiencies and peaking conditions. Based on previous analysis, the proposed parking

Table 20

PARKER ATTITUDES - ENCLOSED WALKWAY
Newark Pennsylvania Station
Newark, New Jersey

TRIP PURPOSE	TOTAL PARKERS(1)	PARKERS WILLING TO WALK EXTRA DISTANCE		PARKERS WILLING TO WALK EXTRA DISTANCE AND PAY $0.25 EXTRA	
		Number(1)	Percent(2)	Number(1)	Percent(2)
Work/Business	2,568	1,726	67	1,113	43
Shopping	67	67	100	67	100
School	34	34	100	34	100
Social/Recreation	32	32	100	32	100
Personal	231	138	60	128	55
Other	77	77	100	77	100
TOTAL	3,009	2,074	69	1,451	48

(1) Number of parkers represents two-day, combined total.
(2) Percent of total parkers.
SOURCE: Wilbur Smith and Associates Field Survey Week of November 5, 1979.

Table 21

RECOMMENDED PARKING GARAGE SIZE
Proposed Newark Penn Station Rail-CBD Parking Garage
Newark, New Jersey

ITEM	ESTIMATED PARKING SPACES
Estimated 1988 Public Parking Space Needs	2,000
Estimated 1988 Gateway III Parking Space Needs	575-875
Estimated 1988 Rail Parking Space Needs	2,235
TOTAL	4,810-5,110
Estimated 1988 Adjusted Parking Supply	2,975
Estimated Parking Space Deficit (000)	(1,835-2,135)
Estimated New Parking Spaces	1,650-1,950
Recommended Garage Size	
Rail	600
CBD	1,200

ramp size for the exclusive rail parking facility, as well as for the CBD parking facility, is approximately 10 percent less than the estimated 1988 deficit, as it is likely that some parkers will seek to walk further distances and park outside the study area in order to reduce their cost of parking. This is commonplace, especially when the proposed parking facility will require much higher costs than remote parking areas.

As noted, as a result of the first phase of Gateway III, (575,000 square feet) the elimination of parking on existing or planned Newark Housing Authority land and projections of future activity, the study area will require 1,700-1,950 parking spaces. In order to meet this deficit, a rail parking garage totaling 600 spaces is recommended on Site A or B and a garage of approximately 1,200 spaces on Site C for Gateway III and other CBD needs.

Chapter 6

ECONOMIC FEASIBILITY ANALYSIS

The foregoing chapters have documented characteristics of rail passengers and described the derivation of parking demand estimates. This final chapter addresses economic considerations with respect to the proposed parking garage. For purposes of this analysis, three scenarios have been addressed as follows:

- Construction of a 600-space rail parking garage on Site A;
- Construction of a 600-space rail parking garage on Site B; and,
- Construction of a 1,200-space central business district parking garage on Site C.

Development Cost Estimate

Estimated development costs have been prepared for all three scenarios. Table 22 presents the estimated development cost for the 600-space rail parking facility on Site A or B. As noted, land acquisition is estimated at $300,000. This assumes that the Newark Redevelopment and Housing Authority will acquire the land including all costs for tenant relocation and demolition and sell back the land at $2.50 per square foot (60,000 square feet). The basic construction cost for the garage is estimated at $4.5 million (assuming $7,500 per space) in 1982, and the pedestrian bridge is estimated at $600,000. Current construction costs in Newark reflect $6,200 per space costs. Including contingencies, design fees, and insurance during construction

Table 22

ESTIMATED PROJECT CONSTRUCTION RELATED COSTS
Proposed 600-Space Rail Parking Facility

Site A and B Development

Newark, New Jersey

ITEM	ESTIMATED AMOUNT
1. Land Acquisition[1]	$ 150,000
2. Demolition-Relocation[1]	--
3. Basic Construction	
Parking Garage[2]	4,500,000
Overhead Pedestrian Connection (200 feet)[3]	600,000
4. Design Contingency - Program Management[4]	510,000
5. Construction Contingency and Project Reserve[5]	612,000
Subtotal	$6,372,000
6. Design Fees[6]	311,000
7. Insurance During Construction[7]	109,000
8. Direct Development Costs	$6,792,000
Federal Share Participation[8]	3,396,000
Local Share Participation[8]	3,396,000

(1) Data provided by Newark Redevelopment and Housing Authority.
(2) Based on $7,500 per space, free standing garage.
(3) Based on $3,000 per linear foot of enclosed walkway.
(4) 10.0 percent of Item 3.
(5) 12.0 percent of Item 3.
(6) 5.0 percent of Item 5 less Item 1.
(7) 1.75 percent of Item 5 less Item 1.
(8) 50.0 percent of Item 8.

result in an overall direct development cost of $6,792,000, of which the local share to be financed will be 50 percent, or $3,396,000.

The total direct development cost for the proposed 1,200-space CBD parking facility is presented in Table 23. As noted, a total of $16,245,600 is estimated for this facility. Land costs for this facility are estimated at $200,000 for 80,000 square feet. A larger parcel of land will be required for the 1,200-space facility in order to minimize the height of the garage. As current plans envision a garage partially underground, an estimated construction cost of $10,000 per space has been utilized resulting in a $12.0 million garage cost.

Maintenance and Operating Costs

An important element of the economic feasibility analysis is the estimation of annual maintenance and operating expenses. For the proposed facility, estimates are based on local experience in the operation of parking structures, recognizing the type of facility planned and assuming sound and efficient management and administrative practices.

As shown in Table 24, the estimated maintenance and operating costs associated with the 600-space parking facility are presented. The largest component of the estimated operating cost budget is $88,800 for salaries, wages, and employee benefits. This amount will be sufficient to provide 24-hour operation of the facility in response to potential overnight activity patterns related to rail travel. An additional $42,000.

Table 23

ESTIMATED PROJECT CONSTRUCTION RELATED COSTS

Proposed 1,200-Space Newark CBD Parking Facility

Site C Development

Newark, New Jersey

ITEM	ESTIMATED AMOUNT
1. Land Acquisition[1]	$ 200,000
2. Demolition-Relocation[1]	-
3. Basic Construction	
Parking Garage[2]	12,000,000
Overhead Pedestrian Connection (200 feet)[3]	600,000
4. Design Contingency - Program Management[4]	1,200,000
5. Construction Contingency and Project Reserve[5]	1,512,000
Subtotal	$15,212,000
6. Design Fees[6]	765,600
7. Insurance During Construction[7]	268,000
8. Direct Development Costs	$16,245,600

(1) Data provided by Newark Redevelopment and Housing Authority.
(2) Based on $10,000 per space, 50 percent of garage underground.
(3) Based on $3,000 per linear foot of enclosed walkway.
(4) 10.0 percent of Item 3.
(5) 12.0 percent of Item 3.
(6) 5.0 percent of Item 5 less Item 1.
(7) 1.75 percent of Item 5 less Item 1.

Table 24

ESTIMATED 1983 MAINTENANCE AND OPERATING BUDGET

Proposed 600-Space Rail Parking Facility

Newark, New Jersey

ITEM	ESTIMATED ANNUAL AMOUNT (1)
Personnel Costs	
Facility Manager	$ 16,000
Four Full-Time Cashiers	44,800
Part-Time Cashiers (1,500 Hours)	7,200
Part-Time Maintenance Employee (1,000 Hours)	6,000
Subtotal Direct Payroll	$ 74,000
Fringe Benefits on Above	14,800
Subtotal Payroll Costs	88,800
Other Routine Expenses	
Utility Costs	$ 42,000
Insurance Premiums	21,500
Repairs and Maintenance	6,500
Materials and Supplies	6,000
Snow Removal - Miscellaneous	4,500
Elevator Maintenance and Repair Contract	6,500
Subtotal Other Routine Expenses	$ 87,000
Management Fee (2)	14,400
Legal/Audit Fees, Bond Trustee, and Consulting Engineer expenses	18,000
TOTAL	$208,200

(1) Assumes 24-hour garage operation, seven days per week.
(2) Estimated at $2.00 per space per month.

is budgeted for utility costs and additional estimates are provided for routine maintenance, snow removal, insurance, and telephone expenses.

An allowance is indicated for management fees in the amount of $14,400. This reflects administrative costs of the parking operator. An additional allowance of $18,000 is provided for professional fees, resulting in a total estimated 1983 maintenance and operating budget of $208,200.

Estimates of maintenance and operating costs have also been prepared for the proposed 1,200-space CBD parking facility. As noted, the payroll-related costs are estimated at $105,500 and utilities at $95,000. Other costs, including $38,500 for insurance premiums, result in a total budget of $329,000. Table 25 itemizes the operating costs for the 1,200-space facility.

Parking Rate Schedule

Current off-street parking charges are almost exclusively oriented toward all-day parkers with the exception of the Gateway I parking garage and, further, reflect the relatively low costs associated with surface parking. Thus, a revised rate schedule is suggested for future operations, as shown in Table 26 for both the 600-space rail facility and the 1,200 space CBD garage.

The suggested parking charges for the rail parking facility include $1.25 for the first hour. A $0.50 per hour increase is indicated for each hour thereafter up to five hours and an additional

Table 25

ESTIMATED 1983 MAINTENANCE AND OPERATING BUDGET

Proposed 1,200-Space CBD Parking Facility

Newark, New Jersey

ITEM	ESTIMATED ANNUAL AMOUNT (1)
Personnel Costs	
Facility Manager	$ 16,000
Four Full-Time Cashiers	45,000
Part-Time Cashiers (3,100 Hours)	14,900
Full-Time Maintenance Employee	12,000
Subtotal Direct Payroll	$ 87,900
Fringe Benefits on Above	17,600
Subtotal Payroll Costs	$105,500
Other Routine Expenses	
Utility Costs	$ 95,000
Insurance Premiums	38,500
Repairs and Maintenance	14,000
Materials and Supplies	10,000
Snow Removal - Miscellaneous	4,500
Elevator Maintenance and Repair Contract	6,500
Subtotal Other Routine Expenses	$168,500
Management Fee (2)	30,000
Legal/Audit Fees, Bond Trustee and Consulting Engineer expenses	25,000
TOTAL	$329,000

(1) Assumes 18-hour garage operation seven days per week.
(2) Estimated at $2.00 per space per month.

Table 26

SUGGESTED PARKING RATE SCHEDULE

Proposed Newark Penn Station Parking Garage

Newark, New Jersey

PARKING DURATION	SUGGESTED PARKING CHARGE	
	600-Space Rail Garage	1,200-Space CBD Garage
Transient:		
0-1 Hour	$ 1.25	$ 1.25
1-2 Hours	1.75	2.00
2-3 Hours	2.25	2.75
3-4 Hours	2.75	3.50
4-5 Hours	3.25	4.25
5-12 Hours	4.00	5.00
12-24 Hours	5.00	6.00
Monthly:		
Commuter	$55.00	--
Other	--	$75.00

$0.75 would be charged for up to 12 hours of parking. The charge for all day, 24-hour parking would be $5.00. A monthly charge of $55.00 is suggested for rail parkers. Monthly all-day parking currently ranges between $30.00 and $60.00, and by 1983 we would expect the suggested $55.00 monthly charge to be reasonably competitive.

The recommended rate schedule for the 1,200-space CBD facility includes a charge of $1.25 for the first hour with an additional $0.75 for each hour thereafter to a maximum of $5.00 for 5-12 hours. A charge of $6.00 is recommended for 24-hour parking and with a monthly rate of $75.00.

Estimated Gross Parking Revenues

Parking revenues have been prepared for the fifth year of parking facility operation for both the 600-space rail parking facility on Site A and B, and the 1,200-space Central Business District parking garage on Site C. Estimates of gross parking revenue are based on the suggested rate schedule and projections of rail patronage and full occupancy of the proposed Gateway III Development. The results are shown in Tables 27 and 28 for the 600-space facility on Sites A and B and Table 29 for the 1,200-space garage, respectively.

The 600-space rail parking facility on Site A is expected to total $796,100 in annual revenue from parkers. Approximately $614,600 should be realized from transient parkers and an additional $181,500 from monthly parkers patronizing the facility. In the transient parking category, approximately $25,000 is expected to result from parkers having durations of less than 5 hours. Approximately $325,000 can be expected from parkers having durations in excess of 24 hours.

Table 27

ESTIMATED GROSS PARKING REVENUE

Fifth Year of Operation

Proposed 600-Space Rail Parking Facility Site A

Newark, New Jersey

PARKING DURATION	AVERAGE CHARGE PER PARKER	NUMBER OF ANNUAL PARKERS	ESTIMATED GROSS ANNUAL PARKING REVENUE
Transient:			
0-2 Hours	$ 1.50	1,200	$ 1,800
2-5 Hours	2.75	8,300	22,800
5-12 Hours	4.00	28,000	112,000
12-24 Hours	5.00	30,000	150,000
1-2 Days	8.00	17,000	136,000
Over 2 Days	13.00	14,800	192,000
Subtotal			$614,600
Monthly:			
All Parkers	$55.00	275	$181,500
TOTAL			$796,100

Table 28

ESTIMATED GROSS PARKING REVENUE

Fifth Year of Operation

Proposed 600-Space Rail Parking Facility Site B

Newark, New Jersey

PARKING DURATION	AVERAGE CHARGE PER PARKER	NUMBER OF ANNUAL PARKERS	ESTIMATED GROSS ANNUAL PARKING REVENUE
Transient:			
0-2 Hours	$ 1.50	1,000	$ 1,500
2-5 Hours	2.75	7,500	20,600
5-12 Hours	4.00	25,500	102,000
12-24 Hours	5.00	27,500	137,500
1-2 Days	8.00	15,500	124,000
Over 2 Days	13.00	13,500	175,500
Subtotal			$561,100
Monthly:			
All Parkers	$55.00	275	$181,500
TOTAL			$742,600

Table 29

ESTIMATED GROSS PARKING REVENUE

Fifth Year of Operation

Proposed 1,200-Space CBD Parking Facility

Newark, New Jersey

PARKING DURATION	AVERAGE CHARGE PER PARKER	NUMBER OF ANNUAL PARKERS	ESTIMATED ANNUAL GROSS PARKING REVENUE
Transient:			
0-2 Hours	$ 1.75	104,000	$ 182,000
2-5 Hours	3.50	120,000	420,000
5-12 Hours	5.00	33,000	165,000
Over 12 Hours	6.00	2,500	15,000
Subtotal			$ 782,000
Monthly:	$75.00	750	$ 675,000
TOTAL			$1,457,000

(1) Assumes guarantee of 750 monthly parkers from Gateway Development.

Table 28 presents the estimated revenue expected for the 600-space rail parking facility on Site B. As noted, with the exception of monthly parkers, transient parkers patronizing this facility are expected to be 10 percent less than at Site A. The proximity of Site A to the rail station makes this facility more attractive to the rail parker as it can be more readily associated with the railroad station. Hence, the 600-space rail parking facility on Site B is expected to total $742,600 annual revenue from parkers. Approximately $561,100 should be realized from transient parkers and an additional $181,500 from monthly parkers patronizing the facility. In the transient parking category, approximately $20,000 is expected to result from parkers having durations of less than 5 hours. Approximately $300,000 can be expected from parkers having durations in excess of 24 hours.

Estimates of gross parking revenue for the 1,200-space CBD parking garage is shown in Table 29. Total gross parking revenue is expected to be slightly greater than $1.4 million. Gross parking revenue from transient parkers represents 54 percent of the total parking revenue, or $782,000. A total of 750 monthly parkers should add an additional $675,000 resulting in a combined total of $1,457,000 in gross parking revenue from both rail and other areawide parkers.

Estimated Annual Debt Service

The total bond issue size and annual debt service payments have been determined, based on the percentage of the construction-related costs to be financed locally. The estimated bond issue and annual debt service payments have been prepared assuming 30-year bonds with level debt service payments for 28 years at an assumed 10 percent interest. The analysis also includes two

interest payments on the bond issue during the 18-month construction period, legal and financing costs, and a debt service reserve fund equivalent to one year's annual debt service payment (principal plus interest).

Table 30 determines the size of the bond issue and annual debt service payment, required for the proposed 600-space rail parking facility on Site A or B. The total bond issue size is estimated at $4,448,000, with an annual debt service payment of $481,400. Interest received from investment of the construction and debt service reserve fund is expected to reduce the amount to be financed by $369,000.

As shown in Table 31, annual payment of $1,229,000 is anticipated to be required to amortize the cost of providing the 1,200-space CBD parking garage. Based on the local direct development cost of $16,245,600, a total bond issue of $12,108,000 will be required, assuming a project grant of $7.5 million. Almost $1.0 million can be anticipated from investments received from the construction and debt service reserve fund, also reducing the size of the bond issue.

Cost-Income Summary

Activity at parking garages typically reaches a stabilization period at the fifth year of garage operation. Thus the economic analysis has focused on this period. Operating costs, on the other hand, have been projected for the first year of operation and no specific increase in operating costs is projected to the fifth year of operation -- rather, the assumption is made that parking charges will be adjusted as necessary to offset such future increases.

Table 30

ESTIMATED BOND ISSUE - LOCAL SHARE
Newark Penn Station Parking Facility
Proposed 600-Space Garage
Site A or B Development
Newark, New Jersey

ITEM	ESTIMATED AMOUNT
1. Direct Development Cost[1]	$3,396,000
2. Interest Payments During First Two Years[2]	889,600
3. Legal and Financing Costs[3]	50,000
Subtotal	$4,335,600
4. Interest on Investments[4]	(369,000)
Subtotal Costs to be Financed	$3,966,600
5. Debt Service Reserve[5]	481,400
6. Net Bond Issue[5]	$4,448,000

(1) See Table 22.
(2) Interest Payments due on Bonds during 2-year construction period.
(3) 1.5 percent of Item 1.
(4) Interest received from investment of Construction and Debt Service Reserve Fund for local share of entire project.
(5) Based on 30-year Bonds at 10.0 percent interest, level debt service 28-year amortization period.

Table 31

ESTIMATED BOND ISSUE - LOCAL SHARE

Newark Penn Station Parking Facility

Proposed 1,200-Space CBD Garage

Site C Development

Newark, New Jersey

ITEM	ESTIMATED AMOUNT
Direct Development Cost[1]	$16,245,600
Estimated Project Grant	(7,500,000)
Estimated Cost to be Financed Locally	$ 8,745,600
Interest Payments During First Two Years[2]	2,287,000
Legal and Financing Costs[3]	120,000
Subtotal	$11,152,600
Interest on Investments[4]	(945,600)
Subtotal Costs to be Financed	$10,207,000
Debt Service Reserve[5]	1,229,000
Net Bond Issue[5]	$11,436,000

(1) See Table 23.
(2) Interest Payments due on Bonds during 2-year construction period.
(3) 1.5 percent of local finance costs.
(4) Interest received from investment of Construction Fund for entire project excluding project grant.
(5) Based on 30-year Bonds at 10.0 percent interest, level debt service 28-year amortization period.

Table 32 presents a cost-income summary for the three parking garage scenarios. Development of the 600-space rail parking garage on Site A will result in a coverage ratio--ratio of net parking revenue to debt service--of 1.32 or an annual surplus of about $150,000.

Development of the 600-space facility on Site B results in a ratio of net parking revenue to debt service of 1.20, slightly lower than Site A. A total of $582,400 is estimated as available for a debt service payment of $481,400, which results in the 1.20 coverage ratio.

As would be expected, the Site A development for the rail parking facility is much more desirable due to its proximity and visibility with the rail station.

The proposed 1,200-space CBD parking garage should result in a coverage ratio of 1.03, assuming a $7.5 million grant is applied toward this project. This project will require substantial subsidy as a result of the high up front costs associated with constructing and operating a garage which has been assumed to be 50 percent below grade and enclosed requiring mechanical ventilation.

Table 32

COST-INCOME SUMMARY

Proposed Newark Penn Station Parking Facility

Newark, New Jersey

ITEM	PROPOSED GARAGE SIZE AND SITE 600-Space Garage Site A	600-Space Garage Site B	1,200-Space Garage Site C
1. Direct Development Cost(1)	$ 6,792,000	$ 6,792,000	$ 16,245,600
2. Cost to be Financed Locally	3,396,000	3,396,000	8,745,600
3. Total Size of Local Bond Issue(2)	4,448,000	4,448,000	11,436,000
4. Annual Gross Parking Revenue(3)	796,100	742,600	1,457,000
5. Interest from Investments(4)	48,000	48,000	130,000
6. Subtotal Gross Revenue	844,100	790,600	1,587,000
7. Annual Operating Costs(5)	208,200	208,200	329,000
8. Net Revenue Available for Debt Service	635,900	582,400	1,258,000
9. Annual Debt Service(2)	481,400	481,400	1,229,000
10. Coverage Ratio(6)	1.32	1.20	1.03

(1) See Table 22 for 600-space garage site A and site B, and Table 23 for 1,200-space garage site C.
(2) See Table 30 for 600-space garage site A and site B, and Table 31 for 1,200-space garage site C.
(3) See Table 27 for 600-space garage site A, Table 28 for 600-space garage site B, and Table 29 for 1,200-space garage.
(4) Interest received from investment of Debt Service Reserve Fund at 10 percent.
(5) See Table 24 for 600-space garage and Table 25 for 1,200-space garage.
(6) Ratio of Net Parking Revenue to Debt Service.

APPENDIX A

Appendix A

CONDITIONS AND ASSUMPTIONS AS A BASIS FOR PARKING REVENUE FORECASTS

Proposed Newark Penn Station CBD/Rail
Parking Garage

Newark, New Jersey

- The proposed rail facility will contain approximately 600 parking spaces and the central business district facility will contain approximately 1,200 parking spaces, in a multilevel configuration, featuring ease of access and egress within the garage structure and surrounding roadways.

- The proposed facility will be efficiently operated, adequately maintained, and well signed and promoted so as to attract all types of patronage.

- The projection of revenues and operating expenses contained herein are based on present day characteristics of travel. Should a national crisis occur, or should Federal regulations limit vehicle usage, impose restrictions on existing travel characteristics, or increase the cost of or limit the use of fuel, values presented may fluctuate.

- The proposed garage will be equipped with a modern revenue projection system and internal traffic control system, including vehicle detectors, directional and

differential vehicle counters and automatic vehicular directional signing.

- Operating expenses are based on present day costs and are estimated to increase at a rate of 9.0 percent compounded annually to circa 1983.

- The foregoing bond issue will be for a 30-year period, allowing 18 months construction, and a 28-year payout period with annual interest costs of 10.0 percent.

- Charges for parking at the proposed garage are anticipated to be acceptable rates for 1983.

- The parking rate schedule will generate revenues as indicated in the financial feasibility tables.

- Future increases in operating and maintenance costs will be offset on a dollar-for-dollar basis by increased revenues received through appropriate parking rate increases.

- Projections of parking revenues are based on the fifth year of operation and are contingent upon full occupancy of proposed Gateway III developments and projection of rail passengers as described in the report.